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Special operations and the Soldier System: critical acquisition issues

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SPECIAL OPERATIONS AND THE SOLDIER SYSTEM: CRITICAL ACQUISITION ISSUES

by

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Special Operations and the Soldier System: Critical Acquisition Issues

by

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ABSTRACT

This thesis provides the US Special Operations Command (USSOCOM) technology base manager with an unclassified reference document on the Army's "Soldier System," the collective term for the Army's emerging approach to the research, development and acquisition of items used by the individual soldier on the battlefield. Chapters II - IV outline the emerging approach, discussing the Soldier Modernization Plan, the current Army acquisition structure and process, and the Army Science Board "Soldier as a System" study. Chapter V discusses the acquisition responsibilities of USSOCOM, detailing the evolving relationship with the Army requirement development process for individual soldier items. Chapter VI summarizes the thesis findings, assesses the next steps, and makes specific recommendations to USSOCOM.

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GLOSSARY

AAE	Army Acquisition Executive
ACEB	Army Clothing and Equipment Board
AMC	US Army Material Command
ASARDA	Assistant Secretary of the Army for Research, Development and Acquisition
ARDEC	US Army Armaments Research, Development and Engineering Center
ASB	Army Science Board
ATBMP	Army Technology Base Master Plan
ATTD	Advanced Technology Transition Demonstrator
BDP	Battlefield Development Plan
BTA	Best Technical Approach
C3	Command, Control, and Communications
CAC	Combined Arms Center
CAG	Clothing Advisory Group
CASCOM	Combined Arms Support Command
CECOM	US Army Communications and Electronics Command
CIE	Clothing and Individual Equipment
CINC	Commander-in-Chief
CNVEO	US Army Center for Night Vision and Electro-Optics
CFP	Concept Formulation Process
COEA	Cost and Effectiveness Analysis

CRDEC	US Army Chemical Research, Development and Engineering Center
DA	Department of the Army
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations
EPA	Extended Planning Annex
DoD	Department of Defense
HEL	US Army Human Engineering Laboratory
HDL	US Army Harry Diamond Laboratory
HQDA	Headquarters, Department of the Army
JFKSWCS	John F. Kennedy Special Warfare Center and School
JMA	Joint Mission Analysis
JMSNS	Justification for Major System New Start
LIC	Low Intensity Conflict
LLRDAP	Long Range Research, Development, and Acquisition Plan
LRAMP	Long Range Acquisition Management Plan
MAA	Mission Area Analysis
MACOM	Major Command
MAMP	Mission Area Material Plan
MFP-11	Major Force Program - 11
MOA	Memorandum of Agreement
MNS	Mission Need Statement
NRDEC	US Army Natick Research, Development and Engineering Center
ONS	Operational Needs Statement
O&O Plan	Operational and Organizational Plan

PEO	Program Executive Officer
POM	Program Objective Memorandum
PM	Program Manager
PPBS	Planning, Programming and Budgeting System
RDT&E	Research, Development, Test and Evaluation
ROC	Required Operational Capabilities
SEP	Soldier Enhancement Program
SMP	Soldier Modernization Plan
SN-CIE	Statement of Need - CIE
SO	Special Operations
SOF	Special Operations Forces
SON	Statement of Need
SORDAC	Special Operations Research, Development and Acquisition Center
STF	Special Task Force
SSG	Special Study Group
TBAG	Army Technology Base Advisory Group
TBESC	Army Technology Base Executive Steering Committee
TEISS	The Enhanced Integrated Soldier System
TRADOC	US Army Training and Doctrine Command
TSM	TRADOC Systems Manager
TSM-S	TSM-Soldier System
USAAVCS	US Army Aviation Center and School
USAHSC	US Army Health Services Command
USAIS	US Army Infantry School
USAMRDC	US Army Medical Research and Development Command

USARIEM	US Army Research Institute of Environmental Medicine
USASOC	US Army Special Operations Command
USSOCOM	US Special Operations Command

I. INTRODUCTION

A. BACKGROUND

The goal of those supporting the Soldier System concept is to apply the proven Department of Defense "systems approach" to the acquisition of items used by the individual soldier. For the most committed advocates, this means elevating the process of equipping single soldiers to that used for major weapon systems.

The justification for this begins with the observation that individuals do not just "operate" military hardware - in some instances, they themselves constitute the weapon system. In the past, this has certainly been true for the combat infantryman. But it has been often argued, especially by critics of the Soldier System plan, that modern war has reduced the importance of infantry. More and more, combat power comes from software upgrades of stand-off projectiles and the platforms that carry them. In the current climate of deep defense cuts, many critics of the Army's Soldier System initiative contend, the Soldier System is a thinly disguised attempt by the advocates of the affected laboratories and programs to preserve their budgets and jobs, and is not justified by the relatively small dollar volume of the programs involved.

Soldier System advocates counter with two arguments. First, real modern war - meaning the next war, not the last - may mean no such thing. If the next war is of the Low Intensity type, where

high-tech destructive capability cannot be brought effectively to bear, then victory will again depend more on the individual. If "combat" is to be hostage rescues, UN peacekeeping, and drug raids, then individual ability is more important than ever. Nowhere is this notion of individual as a weapon stronger than in the combat special operations forces - Green Berets, Seals, and Rangers - that form the core of United States Low Intensity Conflict (LIC) capability.

Second, regardless of the nature of the next conflict, the technology surrounding items of individual equipment is becoming ever more complex and expensive. Some "leap-ahead" innovations are coming onto the market. The management organization and process developed to buy leather boots, wool jackets and steel helmets is not sufficient to acquire micro-climate controlled body armor, helmets with integrated weapon sights, night vision, global positioning, neuro-sensors and individual radios, and "skin-in" performance enhancement and preventive medicine. Nor can it realistically be expected to nurture the technology base underlying these developments. To expect the current system to accomplish these tasks is to invite cost overruns, schedule delays and performance shortfalls. Indeed, the disjointed system currently in place may even discourage innovation. It certainly inhibits proper integration of all the items issued to today's soldiers.

The current defense budget climate, furthermore, should be seen as a mandate for change, to make the process work better. Many capabilities might not ever be affordable without the savings

accrued from a more streamlined acquisition process. Finally, Soldier System proponents contend that if all of the funds currently programmed for the acquisition of items encompassed by the Soldier System were centrally budgeted, the total dollar amount would make it a Major System under Department of Defense acquisition regulations. To do nothing, in any case, is to eventually fall behind.

Over the last two years, the senior Army leadership has taken several steps to sort out these arguments. The Training and Doctrine Command (TRADOC), after a series of technology based war games and simulations, established a Systems Manager (TSM) to facilitate and coordinate the development of the planning documentation necessary to pursue the Soldier System concept. Various laboratories in the technology base have developed prototype technology demonstrators to evaluate some of the more promising capabilities. The Army Material Command (AMC) conducted a Technical Area Assessment of the technology base to determine the current level of progress. The Chief of Staff commissioned an Army Science Board Summer Study to analyze the situation and make recommendations. All have recommended pursuing the concept. Within the Army, a decision point is at hand.

Within the special operations community, these developments have been watched with interest. The United States Special Operations Command (USSOCOM) - the new joint, unified organization with the final responsibility for acquiring equipment for special operations forces - has two concerns. The first is that the Army

will do too little. If the systematic modernization of weapons and equipment used by the individual soldier is not realistically pursued within the Army, then valid USSOCOM requirements will have to be met through other channels. This possibility has disturbing POM implications for USSOCOM.

A second and more subtle concern is that after the Soldier System management concept has been approved in some form by the Army, programmatic trade-offs will have to be made between the two arguments favoring the Soldier System outlined above. The fear is that the low volume, unique needs of the relatively few special operations soldiers will be lost in Army's pursuit of affordable equipment to meet the needs of the still much larger "conventional" Army. If this fear is realized, then the intent of the special acquisition authority given to USSOCOM by Congress - one of the most basic reasons for USSOCOM's existence - will have been circumvented.

This thesis was originally sponsored by USSOCOM to investigate this latter concern and to identify the "interfaces" with the new Soldier System where USSOCOM could effectively input special operations requirements into the Army's modernization plans. Two developments over the course of thesis research have lessened the immediacy of this fear.

First, Soldier System advocates and managers in the Army - understanding that special operations requirements exert the strongest user technological "pull" on the system, that the highly specialized small unit organization of these forces forms an ideal

test-bed, and that Congress is still perceived to be favorably disposed towards USSOCOM - have welcomed special operations input at every level. At the same time, a systematic requirements development process is emerging within USSOCOM. Currently, there is no interface "problem."

Second, the complexity of the current defense budget debate has slowed the decision process in the Army. A program management office under a general officer (PM-Soldier) to take the Soldier System from the technology base to fielded equipment was originally to have been activated in August 1991. Final approval of this step has been postponed until at least March 1992.

This thesis, therefore, presents a "snapshot" of the Soldier System. The general conclusion is that the Army is on the right track and ought to follow through with the management plan even though some of the capabilities promised by the technology base community may not be realized. USSOCOM has a very good opportunity to leverage a relatively large amount of Army funds to develop equipment required by special operations forces. The most effective way for USSOCOM to accomplish this is to maintain concurrent and reinforcing combat development, technology base, and top-level program management interface channels with the Soldier System.

B. OBJECTIVE

The objective of this thesis is to provide the USSOCOM technology base program manager with an unclassified reference

document on the Army's Soldier System. The concluding section provides analysis and recommendations for USSOCOM consideration.

C. RESEARCH QUESTIONS

The primary research question is: What is the Soldier System and how does it affect USSOCOM?

Subsidiary research questions are:

- What is the systems approach to acquiring items for use by the individual soldier, and what benefits does it offer? What is included in the Soldier System?
- What is the current level of the technology base for individual soldier items? What are the major technologies, programs and organizations that constitute this base? What are the major funding profiles?
- What is the current Army management organization and process for acquisition of items encompassed by the Soldier System concept? What has the Army done to assess and improve the effectiveness of this process?
- What are the major findings and recommendations of Army studies of the Soldier System concept and technology base? What are the proposed changes?
- What is the USSOCOM acquisition authority and process?
- What are the goals, intent, organization and strategy of USSOCOM acquisition?
- What is the legal basis of the interface between the Army and USSOCOM?
- What are the current USSOCOM interfaces with the Soldier System?
- Are the current Army-USSOCOM interfaces sufficient to effectively communicate special operations requirements to the current Army organization? To the proposed organization?
- How might USSOCOM improve the process of acquiring individual soldier items?

D. SCOPE, LIMITATIONS AND ASSUMPTIONS

The scope of this thesis, as outlined in the introduction, is the changing Army approach to managing the research, development, and acquisition of items worn and carried by soldiers for personal use in combat, and the implications for USSOCOM. The major factors limiting the research effort are the tremendous amount of uncertainty currently surrounding the Army's size and budget and the impact of the pending changes to the Army's acquisition management structure. A minor limiting factor is the current disjointed method of resourcing the many programs and projects involved. Although many Soldier System programs are stable, the large number of related small projects by the various laboratories involved has made monitoring the status of each component of the total Soldier System difficult.

The major assumption in this thesis is that the reader is familiar with the major tenants and policies of Defense acquisition, but is otherwise unfamiliar with the Soldier System and USSOCOM.

E. LITERATURE REVIEW AND METHODOLOGY

Information presented in this thesis was gathered during visits to the more significant organizations involved, interviews with senior managers, command briefings, organizational memoranda of record, and a review of Army, DoD, and USSOCOM regulations. There is little published material on this subject.

F. ORGANIZATION

Chapters II-IV discuss the Soldier System concept. Chapter II provides general background information - the systems concept is defined, the Soldier Modernization Plan (SMP) is discussed in detail, and the current Army soldier item technology base outlined. Chapter III outlines the current Army acquisition management structure and process relevant to the Soldier System. Chapter IV presents the conclusions of the Army Science Board's Summer Study.

Chapter V summarizes the organization, interests, and acquisition strategy of USSOCOM. The current Army-USSOCOM requirement development and technology base interfaces are noted here.

Chapter VI presents the thesis conclusions, including specific findings, analysis of future prospects, and specific recommendations for USSOCOM consideration.

II. SOLDIER MODERNIZATION

A. INTRODUCTION

The purpose of the Soldier Modernization Plan (SMP) is to provide a comprehensive plan to modernize the soldier as a battlefield system. It is one of the 18 Army Coordinated Modernization Plans. The plan covers the full range of research, development and acquisition from technology base to systems development to the fielding of soldier items between 1991-2006. In the SMP, all items that the soldier wears, carries, or consumes on the battlefield are considered interrelated and assessed for impact on combat capabilities in five areas - lethality, command and control, survivability, sustainment, and mobility. A sixth area, medical, has been included in the technology base parts of the plan.

The SMP explicitly assumes the "Soldier System" concept as the basic strategy: the modernization effort is designed to fully draw on the expertise and advances related to these six capabilities from all sources within the Army, the other services, allies, and industry to provide state of the art technologies, and then to integrate these to produce a system with synergistic improvement in combat effectiveness. Although the current version of the plan focuses primarily on the dismounted soldier, vehicle crewmen (both air and ground), along with the capabilities required to support

the soldier, such as field and health services, are to receive greater emphasis in the next update. [Ref. 1:p. 75]

The plan outlines four phases: Current (FY92), Near Term (FY93-94), Mid Term (FY95-98), and Far Term (FY99-2006), although each component system is defined as either a Next Generation System (Block I) or a Future System (Block II). [Ref. 2:p. 4.1-4.5, p. 6.5-6.6] Next Generation systems and capabilities are basically those programs scheduled for fielding in the Mid Term. Future Systems are those still in Milestone 0, supported by 6.1 and 6.2 dollars, and not scheduled for fielding in current Army long range plans. It is very important to note that the SMP is not just a material document - training and doctrine development are addressed in connection with each capability and system.

The SMP, furthermore, recommends a program management reorganization similar to that proposed in the Army Science Board study (Chapter VI). The plan is currently being used to develop the baseline documents for the programs encompassed by the system definition and has been integrated into the various other Army master planning documents. As this thesis is written, the SMP is still being revised for signature by the Chief of Staff and Assistant Secretary of the Army for Research, Development, and Acquisition (ASARDA).

This chapter has five parts. Parts B (Systems Approach) and C (Army Modernization) provide background information defining the "systems approach" and role of Army modernization plans. Part D (SMP Programs) outlines the current items being fielded, the next

generation systems with supporting Advanced Technology Transition Demonstrators (ATTD) and major technology demonstrations, and future systems covered in the SMP. Part E (Funding) gives the current funding levels. Part F (SMP Status and Recommendations) summarizes the SMP recommendations and current status. Appendix A (Acquisition "Roadmap") and Appendix B (SMP Organization and Proponents) are attached for reference.

B. SYSTEMS APPROACH

1. Definition

The experience of recent decades indicates that properly coordinated and functioning man-made systems require the application of a well integrated "systems" approach to minimize undesirable side effects. This is the implicit assumption underlying the integrated management framework for Defense Acquisition outlined in DoD 5000.1. The "effective interaction" of the three major DoD acquisition decision support systems - Requirements Generation; Planning, Programming, and Budgeting (PPBS); and Acquisition Management - are "essential for success." [Ref. 17:p 2-1] Furthermore, the intent of the "design evolution" process, described as the focus of acquisition management, is to develop an affordable "stable system design" that meets a valid operational requirement. [Ref. 17:p. 2-6]

A "system" in this design sense is an "assemblage of elements" forming and operating as a "complex whole." [Ref. 18: p. 1] In practice, this means that all aspects of a product being

developed must be considered together - from the identification of a need for an item, to funding its development and fielding, life cycle costs and logistic support, design and manufacture, user interface and training, testing, tactics governing its use, and, most difficult of all, its interface with other systems.

Public law and Government regulations and policy mandate this. According to Title 10, US Code, Section 2302(5) "Definitions: Major Systems," a "Major System" within the DoD is any system estimated to eventually cost $115m in FY1990 constant dollars for research, test, development, and evaluation, or $540m for procurement. [Ref. 19:p. 3] All others are "Nonmajor". [Ref. 19:p. 3] Each type must adhere to specific management organization and control policies outlined in DoD 5000.1 and 5000.2.

2. Traditional Approach to Soldier Items

This "systems approach," however, has traditionally not been fully applied to the development and procurement of items worn, carried and consumed by individual soldiers in the field. In some instances, the acquisition process of certain items - uniforms and boots, for example - predate current practices. In a few other cases, valid needs can be met with only minor modifications to items readily available on the commercial market. Work gloves, flashlights, ski's, knives, handguns, and rucksacks are among such examples. In most all cases, the relatively small dollar value and "low technology" simplicity of each item - considered in isolation from all the other items - have allowed development and procurement to occur outside of the major system framework.

Funding, likewise, has traditionally been disjointed, spread across many organizations from different appropriations accounts and generally without any centralized accounting or control. In general, "systems integration" has been left to the individual soldier.

Collectively, however, this disjointed approach has led to some significant shortcomings. The current Nuclear-Biological-Chemical (NBC) protective mask does not allow a soldier to use the sights on the M16 rifle. The Kevlar helmet cannot be worn together with the cold weather parka hood. The helmet developed for combat vehicle crewmen does not allow the soldier to wear the issue laser protective goggles, and the helmet's electronics were found to be incompatible with the intercom systems in many vehicles. The NBC protective gloves are too stiff to allow certain radios to be accurately tuned. Load bearing equipment cannot be worn over the ballistic vest ("flack jacket") or in many armored vehicles. [Ref. 15]

3. Emerging Approach - Next Steps

Much more worrisome, however, are the larger integration problems looming on the horizon, as the technological complexity and costs of individual soldier items increase. Cost, schedule and performance risks are all rising. The mix of organizations and processes traditionally charged with managing the acquisition of these items, many believe, is simply insufficient for the task. The solution, it is being argued, is to elevate the concern for soldier items to the equivalent status of a major weapon system -

to designate the "Soldier System" as a Major System in accordance with DoD 5000.1 and 5000.2.

The Soldier Modernization Plan (SMP) is a large step in this direction. To understand this, however, it is necessary first to review the Army's modernization strategy and goals, and the role of modernization plans.

C. ARMY MODERNIZATION

1. Concept

The Army views modernization in terms of warfighting "capabilities." The development and implementation of doctrine, organizations, and leadership and training programs that enhance the Army's ability to win wars are considered equally with the development and fielding of weapons and the associated concern for the production and technology base. "During the coming period of declining resources, the Army cannot afford to satisfy every requirement with a new weapon system." [Ref. 1:p. 67]

The long term focus must be to "pursue future modernization sufficient to ensure our smaller Army has the lethality essential for victory on tomorrow's battlefield" by selecting systems that take advantage of all of the Army's strengths (well trained soldiers and leaders as well as technology) and exploit the weaknesses of potential adversaries. [Ref. 1:p. 67] "To sustain this long term focus, we must actively manage risk in the near and mid-term. We will accomplish this by concentrating on the deployability and staying power of our forces, upgrading systems

where high payoff in operational or support and personnel savings is evident, and by terminating programs that provide marginal improvements in warfighting or sustainability or are determined to be unaffordable." [Ref. 1:p. 68]

2. Strategy and Modernization Plans

Five principles have been established to guide all Army modernization [Ref. 3:pp. 61-62]:

- Field new equipment in priority, beginning with units that are first to fight.
- Field advanced warfighting capabilities before potential adversaries.
- Design equipment for future modernization.
- Modernize by force "package" (i.e., field the combination of new systems, doctrine, organization and training together rather than piecemeal to the receiving units).
- Design, build, and distribute equipment to optimize readiness and training.

To implement this strategy, the Army has developed an Army Technology Base Master Plan and 18 "Modernization Plans." Each modernization plan serves four basic system integration functions. First is to establish a firm and clear link between technology and user requirements. Second is to integrate these links into the PPBS process. Third is to provide specific guidance to the actual material developer articulating these requirements and the resources available. Fourth is to provide the necessary guidance to the developers of doctrine, tactics and force structure.

Thus, each modernization plan is based on mission and functional area requirements and includes provisions for three main concerns: equipment life cycle, force structure, and training and doctrine development. [Ref. 1:p. 68] Each plan encompasses all systems or families of systems with similar combat functions (e.g., armored forces, intelligence, fire support, etc.), sets program priorities, promotes integration and commonality of effort within all of the battlefield functional areas, and covers the Total Army over the next 20-30 years. [Ref. 1:p. 69] Each plan is updated annually to reflect external factors, such as changing threats, technological breakthroughs or delays, revised funding or personnel levels, and evolving Army missions. "Consequently, the plans incorporate the integration of new systems, product improvements to existing equipment, and procurement of nondevelopmental items." [Ref. 1:p. 69]

Modernization plans are developed jointly by the TRADOC, AMC, and the various Army laboratories for approval by the Chief of Staff and Secretary of the Army. The Army Acquisition Executive - the Assistant Secretary of the Army for Research, Development and Acquisition (ASARDA) - is the supervisory office for actual material systems modernization.

The Soldier Modernization Plan is the newest of the Army Modernization Plans, originally scheduled for completion in FY 91. Its purpose is to improve the capabilities of the soldier by means of a "systematic, integrated plan that addresses long-term requirements, priorities, and funding." [Ref. 1:p. 75] The plan

encompasses all items "worn, carried, or consumed by the soldier in the field." [Ref. 2:p. 1.1]

D. SMP PROGRAMS

1. General Overview

The original draft of the SMP focused on 28 tasks in the area of small arms and munitions, clothing and individual equipment (CIE), communications and navigation aids, and food and shelter of direct concern to the "light" (dismounted) soldier. [Ref. 1:p. 75] Each was previously autonomously pursued within the Program Executive Officer (PEO) and Army Material Command (AMC) program management and technology base management structure. [Ref. 4] The current draft is being expanded to include medical items, especially NBC, the needs of vehicle crewmen and other soldiers, and the large number of capabilities required to support the soldier, such as field services (messing, laundry, and baths) and health services. [Ref. 5]

Additionally, the plan is establishing priorities and other guidance for the implementation of the Congressionally mandated Soldier Enhancement Program (SEP). [Ref. 5] The SEP is intended to increase the lethality of infantry weapons, improve the living conditions of soldiers in the field, and correct deficiencies identified during Desert Shield/Desert Storm by streamlining the development cycle and the process for fielding selected non-developmental ("off-the-shelf") items. [Ref. 6:p. 1]

Actual hardware in the SMP is divided into three categories: items currently being fielded; the Next Generation systems with supporting Advance Technology Transition Demonstrators (ATTDs) and major technical capability demonstration projects; and Future Systems. Appendix A (Acquisition Roadmap) graphically shows the relationships between the various Next Generation and Future Systems.

2. Current Systems

Items currently being introduced for individual equipment issue to Army soldiers were developed and funded before the Soldier Modernization Plan was written. [Ref. 5] Significant examples include the new flame retardant undergarments for armor crewmen, the five man shelter/sleeping system, the new wet-weather and cold-weather suites, the expanded ration menu, the improved vehicle intercom, laser eye protection, and the M4 Carbine. [Ref. 7] Many other new and relatively less costly items (e.g., the new flashlight, water resistent socks, pocket knifes, and 40mm grenade) are part of the Soldier Enhancement Program (SEP). [Ref. 8] Although items currently being delivered to the field are largely outside of the SMP framework, these items are included in the plan to allow the SMP to serve as a comprehensive subject reference, to establish clearer priorities for SEP, and to provide a baseline for future updates of the plan. [Ref. 5]

3. Next Generation Systems

The greatest focus of the SMP is on the eight Next Generation Systems, referred to collectively as the Block I Soldier, and

the large number of previously disjointed ATTDs and technology capability projects that need to be successfully integrated to field a true Soldier System. According to the Army Material Command (AMC) Technolgy Base Assessment, the SMP Block I Soldier makes use of advances in nine of the congressionally identified Base Technology Areas: Lightweight Power; Exoskeletal Structures; Modeling and Simulation; Miniaturization of Electronics; Advance Materials; Biotechnology; Neuroscience; Artificial Intelligence; and Robotics. [Ref. 9]

The eight Next Generation Systems are [Ref. 2:p. F-3]:

- The Enhanced Integrated Soldier System (TEISS)
- Advanced Integrated Man-Portable System (AIMS)
- The Objective Individual Combat Weapon (OICW)
- The High Speed Mass Assault Airdrop System
- The Joint Family of Operational Rations
- Individual Training System
- NBC Individual Protection System
- NBC Decontamination System

The Block I Soldier, considered as a major system, is currently programmed for Engineering and Manufacturing Development and initial Production and Deployment during FY 94-98, although some elements may be pushed back beyond 2000. [Ref. 7]

The "cornerstone" of TEISS is the Soldier Integrated Protective Ensemble (SIPE) program managed by the Natick Research,

Development and Engineering Center (NRDEC). [Ref. 5] SIPE is a three year (FY 92-94) $10m ATTD to provide proof of principle of the thesis, "The Soldier is a System." [Ref. 10] The SIPE program currently pools research and funding from TRADOC, the Armaments Research Development and Engineering Center (ARDEC), the Human Engineering Laboratory (HEL), the Center for Night Vision and Electro-Optics (CNVEO), the Chemical Research, Development, and Engineering Center (CRDEC), and the Communications and Electronics Command (CECOM). [Ref. 10] TEISS will integrate the contributions of other research into SIPE's eight "modules" (sub-systems) [Ref. 10]:

- Clothing & Individual Equipment (CIE) (Uniform, Footwear, Handwear)
- Ballistic (Helmet, Torso Armor, Facepiece)
- C4I (Computer, GPS, Compass, Software)
- Electro-Optics (Image Intensifier, CCD Camera,Displays, and Thermal Sights)
- Chem-Biological (Respiratory Device/Filter, Detection Sensors)
- Microclimate/Power (Blower, Filter, Power, Air Distribution)
- Load Bearing Equipment (Harness/Belt, Packs)
- Weapon (Individual Weapon and Ammunition)

TEISS will enter Phase II (Engineering and Manufacturing Development) in FY 94-97, with some modules fielded by FY 98. [Ref. 2:p. 6.5] Concept Demonstration and Validation will continue on all eight modules in two follow-on SIPE programs: Crew SIPE

(Air) and Crew SIPE (Ground). [Ref. 9:pp. II-K-3 - 5] The intent of the modular approach is to allow greater flexibility in the fielding plan, and, after fielding, to allow tactical commanders to choose the modules required for specific missions. [Ref. 11]

In addition to medical, nutritional, and field services research and development, discussed below, other significant programs to be integrated into TEISS include the Soldier C3 Demonstration, Dismounted Future Combat Soldier System, and Head Mounted Thermal Imaging Project. [Ref. 9:pp. II-K-4 - 6]

The Objective Individual Combat Weapon (OICW) is part of the Objective Family of Small Arms Project, currently managed by the Armament Research, Development and Engineering Center (ARDEC). In addition to OICW, the long range small arms program is supported by two other technology demonstration projects - the Objective Proposal Defense Weapon (OPDW) and Objective Crew Served Weapon (OCSW). [Ref. 9:p. II-K-3a]

The High Speed Low Altitude Personnel Airdrop Program and Advanced Aerial Insertion System are the current evolution of the long-standing research program into parachute technology by NRDEC [Ref. 5]. Cargo Airdrop, part of the same research project, is not included in the Soldier System.

The Joint Family of Operational Rations, being developed by the US Army Research Institute of Environmental Medicine (USARIEM), consists of the Assault Ration, Individual Field Ration, and Group Feeding Programs. [Ref. 12]

The two NBC systems are products of the System of Medical, Chemical and Biological Defense, one of the four medical systems in the Surgeon General's Health Service Modernization Plan that must be integrated into the Soldier System. The other three are the System of Medical Defense Against Infectious Diseases, the System of Combat Casualty Care, and the System of Soldier Protection, Sustainment and Enhancement.

The System of Medical Defense Against Infectious Diseases is the program overseeing all Army research into vaccines. The System of Combat Casualty Care is a collection of programs seeking to enhance casualty return-to-duty rates, primarily through developing expert computer systems for triage and diagnosis at battalion aid stations, and neuroscience research for improved treatment of psychiatric casualties. The System of Soldier Protection, Sustainment, and Enhancement is an on going research program to develop products to reduce performance degradation caused by the actual military environment - such as temperature and altitude extremes, reduced sleep, overpressure and vibration, toxic chemical by-products of weapons, exposure to directed energy weapons, and personal hydration and dietary supplements. [Ref. 9:p. II-K-3a]

The 14 research projects currently contained in the Army Technology Base Master Plan for medical systems that are directly related to research for the Soldier System illustrate the broad scope of this area: Laser Protective Eyewear, Non-Refrigerated Blood Substitutes, Cyanide Pretreatment, Liposome Delivery Vaccines

and Drugs, Water Quality Analysis Kit, Head Injury Therapeutic Technology, Endotoxin Detection, Auxotrophic Mutant Vaccine Vectors, Mouse-Human Chimeric Antibodies, Non-Toxic Broad Spectrum Kit, Protosome Complex Vaccines, Chimeric RNA Vaccines, and Neural Network Software Demonstration to Analyze Lung Injury. [Ref. 9:p. II-K-3a]

4. Future Systems

Also known as Block II, these are Phase 0 (Concept Exploration and Definition) programs anticipated to be ready for fielding in FY 98-2006 and beyond. [Ref. 5] As currently programmed, these include the Future Combat Soldier System (currently unfunded); the Rapid Deployment Food Service Systems; the Combat Field Feeding Army 21; Advanced Aerial Insertion System, and the future NBC Individual Protection System and NBC Decontamination System. [Ref. 9:p. II-K-3a]

E. SOLDIER SYSTEM FUNDING

1. General Overview

At least three major attempts have been made over the last 18 months to calculate the total amount of dollars currently programmed for research, development and acquisition of items used by the individual soldier on the battlefield. Each attempt has reached a different conclusion, although each total classifies the Soldier System as a Major System. The reasons for the difficulty in assessing current Soldier System funding levels are discussed below, followed by the results of the three studies.

2. Funding Assessment Problems

Funds for research, development and acquisition are divided into four categories - 6.1 (Basic Research), 6.2 (Exploratory Development), 6.3A and 6.3B (Advanced Development), and 6.4 (Engineering Development) - but are allocated by Program Element (PE). Each PE is subdivided into projects composed of different "Work Packages." For example, PE 64713 (Combat Feeding, Clothing, and Equipment) is comprised of four projects: DC40 (Unit and Organizational Equipment), DL40 (Clothing and Equipment), D548 (Military Subsistence Systems) and D668 (Soldier Enhancement Program). The Soldier Enhancement Program (SEP), in turn, for example, contains 32 different work packages, ranging from weapons, CIE, food, and compasses. [Ref. 2:p. G-1]

Funds intended for soldier modernization have traditionally been controlled by the various PEOs and PEO controlled Program Managers (PMs), AMC PMs, and Engineering Centers within the Army acquisition process. Each PEO, PM and Engineering Center has the latitude to move funds between work packages and projects within their purview. [Ref. 2:p. G-1]

This system of funding has made it difficult to assess total funding for soldier modernization for five reasons.

First, the management of funds for the soldier system is not yet centralized into one organization - the current calculations of levels of expenditure are based on "snapshots" of information provided by the many PEOs, AMC PMs and Engineering Centers involved. [Ref. 4] Because of the overlap of research

areas and desired application of the same research result to many different systems, it is especially difficult to earmark basic research dollars against a specific system.

Second, the current expansion of the SMP to cover individual soldier specific medical and NBC research and development, crew and other soldiers, and field and health services, has made the accounting task more difficult. [Ref. 4] It has not yet been sorted out.

Third, the current budget climate has caused further uncertainty and decreased program stability.

Fourth, on top of the system described above, research, development and acquisition resources come out of many different appropriation accounts. [Ref. 2:p. G-1] Each appropriation has different laws which govern the use of those specific funds. The actual purchase of most items now included in the soldier system has traditionally come out of four appropriations: OMA, OPA-3, OPA-2, and WCTV. [Ref. 2:p. G-1] Clothing and Individual Equipment (CIE), as well as other low dollar value ($15,000 and below), expendable, non-centrally managed and reportable items, have previously come out of Operations and Maintenance, Army (OMA). [Ref. 2:p. G-1]

Other Procurement, Army-3 (OPA-3), an element by element congressionally approved appropriation, is normally used for higher dollar value, centrally managed investment type items, but is also currently the source of funds for other items, including the NBC Individual Protection System. [Ref. 2:p. G-1] Command and control

items, likewise, including those now part of the soldier system, are funded out of Other Procurement, Army-2 (OPA-2), an account very similar to OPA-3. [Ref. 2:p. G-1] The funds for individual soldier weapons are currently contained in the Weapons, Combat Tracked, Wheel Vehicles (WCTV) account. [Ref. 2:p. G-1] Ammunition is purchased through a separate ammunition appropriation. [Ref. 2:p. G-5]

Finally, the program elements developed for last year's budget request (and used in Annex G) were defined prior to the development of the current SMP. Thus, they are often not in sync with specific soldier system work packages defined elsewhere in the modernization plan. [Ref. 2:p. G-2]

3. Funding Assessments

As a consequence of the five problems discussed above, the AMC Soldier System Technology Area Assessment, the Army Science Board Soldier System study, and the funding annex (written by AMC) of the SMP, each calculated total funding by slightly different criteria. The bottom lines of each, therefor, vary significantly. A snapshot of each is presented here.

Tables 2-1 and 2-2 show the total life cycle profile presented in the AMC Technology Base Assessment. This profile does not include any medical (the most difficult to attribute directly to the soldier system), field or health-service RD&A and procurement expenditures. [Ref. 14]

Table 2-1: SOLDIER SYSTEM PROCUREMENT FUNDING (AMC)

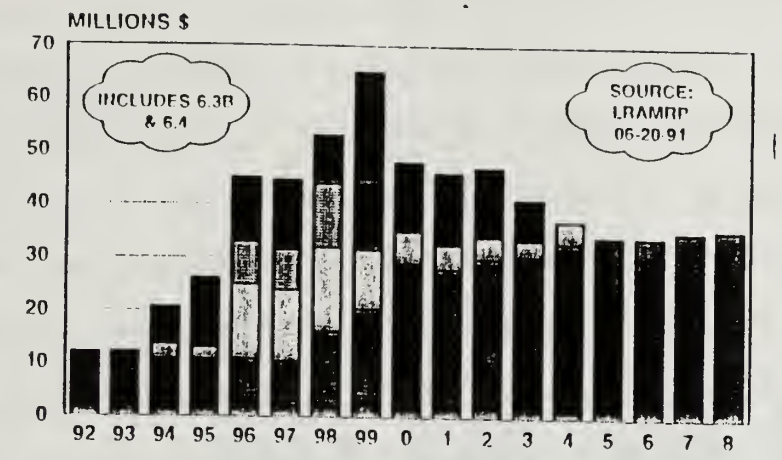
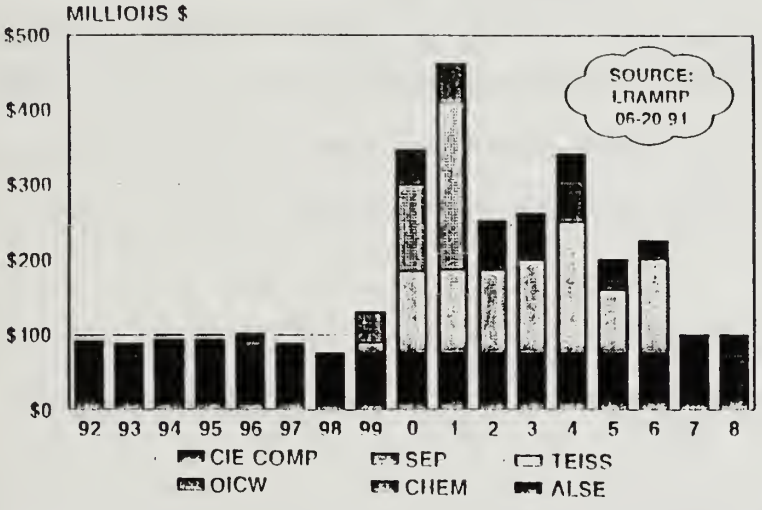


Table 2-2: SOLDIER SYSTEM RDT&E FUNDING (AMC)



CIE COMP - CIE COMPONENTS
SEP - SOLDIER ENHANCEMENT PROGRAM
TEISS - THE ENHANCED INTEGRATED SOLDIER SYSTEM
OICW - OBJECTIVE INDIVI COMBAT WEAPON
CHEM- NEXT GENERATION NBC MASK
ALSE - AVIATION LIFE SPT EQUIPMENT

The ASB reported that total Soldier System funding - excluding SEP, medical, and field and health services - is estimated to be $278m for Army RDT&E for FY 92-99, and $347m for FY 00-08. [Ref. 15] Procurement costs are programmed for $718m for the near and mid-term, and $2.255b for FY 00-08. [Ref. 15]

Annual Soldier System related Medical RDT&E is currently projected to fluxuate between $127m and $145m through FY 97. [Ref. 16]

Soldier System dollar resources currently listed in the SMP are divided into two funding categories - technology base (6.2 and 6.3A) and "System Funding" (6.3B and 6.4) - and totaled by capability area. Two capability areas, mobility and sustainment, however, have yet to be delineated from the other three. In some instances the SMP total includes money spent on programs outside the control of the current Soldier System material development organization. [Ref. 2:p. G-1] Weapon system and ammunition acquisition, a part of the SMP, is not included, nor does the SMP contain any 6.1 resources. Funding levels given in the SMP are shown in the tables below, based on the FY 92/93 President's Budget submitted to Congress in the 2nd Quarter, FY 91. [Ref. 2:pp. G-3 - 6]

Table 2-3: SOLDIER SYSTEM 6.2 AND 6.3A FUNDING (SMP)

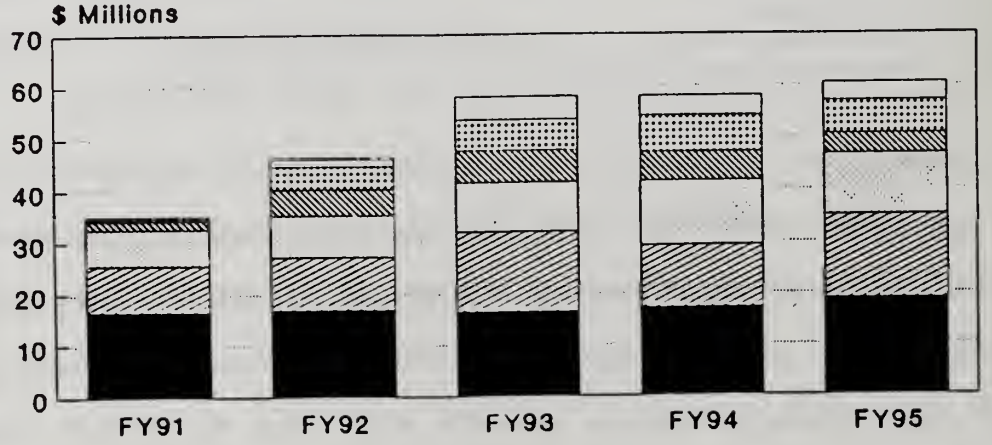


Table 2-4: SOLDIER SYSTEM 6.2 AND 6.3A UNFUNDED (SMP Annex F)

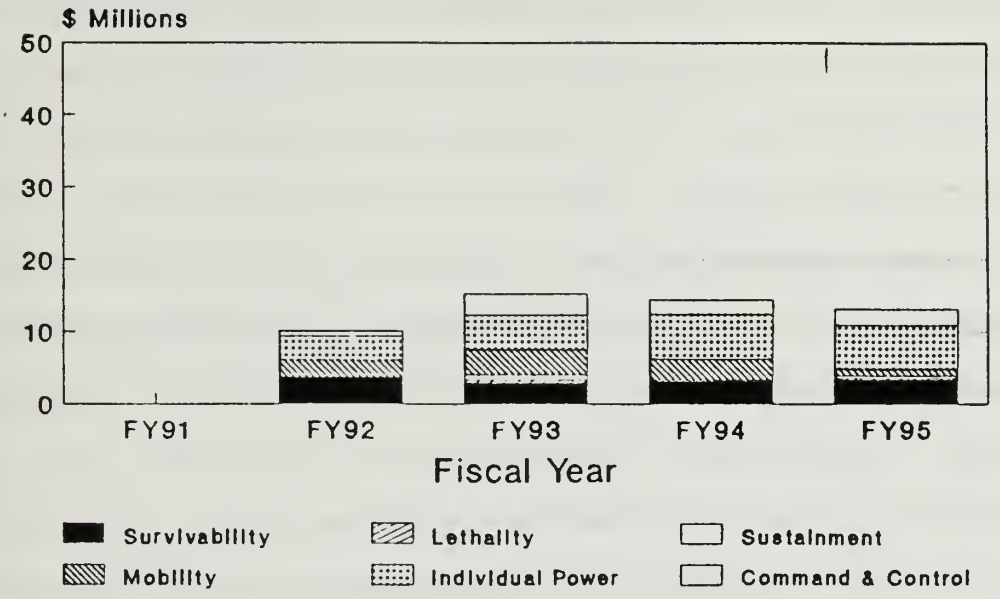


Table 2-5: SOLDIER SYSTEM 6.3B AND 6.4 FUNDING (SMP Annex G)

	($Million) FY92	FY93	FY94-97
Lethality			
R&D	175.3	165.1	439.3
Acquisition	41.2	23.6	58.9
Communication			
R&D	33.0	34.3	142.9
OPA-2	135.5	100.5	483.0
Protection			
R&D	14.2	14.4	56.9
Acquisition	85.6	94.7	332.8
Sustainment - Included Above			
Mobility- Included Above			
Total	484.8	433.1	1,513.8

The Block I program is almost fully funded. [Ref. 15] The Block II program, however, has funding shortfalls for three key technologies. Lightweight power is $25m short of 6.2 funds; Exoskeletal Structures is $7.3m short of 6.2 and $6.2m of 6.3A; and Advanced Materials is $3.9m short of 6.1 and $12.5m of 6.2. [Ref. 16]

Expenditures covered explicitly in the SMP, furthermore, are estimated to comprise only 34.5% of the total currently planned Government investment in soldier system related technology, thus offering a significant opportunity to "leverage" other resources towards the stated objectives of the SMP. [Ref. 16] Other contributors include the Defense Advanced Research Projects Agency (DARPA) (19.6%), various Government, academic, and industry consortia (18.5%), the Army Special Programs Office (18%), the other services (7.6%), and other Government agencies (1.8%). [Ref. 16] Major Force Program 11 (USSOCOM) funds supporting soldier system development were not included in this total, but the USSOCOM technology base program alone will invest over $1 million in soldier technology projects in FY 92. This subject is discussed in Chapter V (USSOCOM). Calculations of investment programs currently pursued by allied governments were not available during the period of thesis research.

F. SMP STATUS AND RECOMMENDATIONS

The original 1991 draft of the SMP contained 13 specific recommendations to the senior Army leadership. The most far

reaching was endorsing the Soldier as a System concept. To accomplish this, the SMP made four recommendations: create a Program Manager for the Soldier System (PM-Soldier); designate all funding through the PEO/PM-Soldier; designate the Soldier System as a Major System in accordance with DoD 5000.1 and 5000.2; and create a TRADOC Systems Manager for the Soldier System (TSM-Soldier). It also recommended that policies and regulations dealing with clothing and individual equipment items be revised to support this reorganization and Block modernization concept. [Ref. 2:pp. i/8.1-3]

Prior to enacting these recommendations, the senior Army leadership commissioned the Army Science Board (ASB) to conduct a Summer Study to more fully assess the subject. Before discussing the findings and recommendations of the ASB, it is necessary to review the current management framework for the acquisition of soldier items.

III. US ARMY ACQUISITION PROCESS FOR SOLDIER ITEMS

A. INTRODUCTION

This chapter discusses the Army acquisition process pertaining to items included in the Soldier Modernization Plan. Soldier System items are currently acquired through three different and well established Army material development processes: Major and Non-Major Systems, Medical Systems, and Clothing and Individual Equipment. Each process performs the two traditional modernization functions - "combat development" to establish material needs, and "material development" to transform these needs into actual equipment - through different channels and according to different regulations.

These channels and regulations are discussed in detail in this chapter to:

- explain the difference between the SMP/Soldier System approach and the material development process currently in place,
- outline the next steps required to establish the Soldier System as a major system within DoD acquisition guidelines, and
- identify the significance of these steps to USSOCOM.

The principal finding is that the SMP recommendation to designate the Soldier System a DoD 5000.2 "Major System" is fully justified, although such a designation will require several

significant institutional changes within the Army. Ideally, these changes would establish the Soldier System as an Army Designated Acquisition Program (ADAP) under the authority of the Army Acquisition Executive (AAE) with a clearly defined program management structure. Without such a designation, implementation of the SMP will be considerably more difficult, and the possibility of effective direct USSOCOM-Soldier System material development will be doubtful.

Part B of this chapter establishes the regulatory basis for the acquisition of soldier items. Parts C (Acquisition Process) and D (Acquisition Responsibilities) discuss the principal Army acquisition system in depth, outlining the process, significant responsibilities, next steps for the Soldier System, and implications for USSOCOM. Part E (Clothing and Individual Equipment) presents the exceptions to the acquisition "rules" in Parts C and D that cover clothing and individual equipment items.

B. REGULATORY BASIS

1. Major, Non-Major, and Medical Systems: AR 70-1

Army Regulation (AR) 70-1, Systems Acquisition Policy and Procedures, implements DoD 5000.1 and 5000.2 to govern the acquisition of Army major and nonmajor acquisition programs. [Ref. 21:p. 1] With the exception of Clothing and Individual Equipment (CIE), the objectives, policies, and principles of this regulation apply to all Army material and medical acquisition programs. AMC-TRADOC Pamphlet 70-2, a "how to" guide for Program Managers

currently being upgraded to a Department of the Army (DA) Pamphlet, is the only authorized supplement. [Ref. 21:p. 1]

Two additional regulations tie into AR 70-1. The Combat Development process for Army managed programs is further detailed in AR 71-9, Material Objectives and Requirements, including specific instructions for preparing requirement documentation and validation for all programs other than CIE. The use of Joint Service Operational Requirements (JSOR) and Operational Needs Statements (ONS) for initiating material development from outside of the Army combat developer community is explained here. Policies of the Army Logistic System, AR 700-9, contains additional guidance on managing the Army Stock Fund for the issue, replenishment and upgrade of Soldier System type items currently in the Army inventory. Special provisions for unprogrammed urgent Special Operations requirements are given in paragraph 2-3, "Requirements determination and acquisition."

Soldier System programs that fall under the purview of AR 70-1 include all medical products, armaments, airdrop, foodstuffs, field services, and some chemical items; that is, all of the Next Generation systems except TEISS. The Soldier System, were it managed as a major system, would be chartered under AR 70-1.

2. **Clothing and Individual Equipment: AR 700-86**

All aspects of the life-cycle management of clothing and individual and equipment (CIE) are governed by AR 700-86. Precisely defined in Appendix C, CIE can generally be thought of as all uniforms, load bearing equipment, footwear, NBC clothing, and Army

heraldic items. Thus, most items currently being fielded in the SMP are CIE, as is the TEISS Next Generation system. CIE, however, covers all 24 Army uniform systems - only seven of which are included in the Soldier System, which is limited to items for use in battle. [Ref. 23:pp. i-iii] AR 700-86 provides for exceptional policies and practices regarding combat and material requirement development, decision and review authority, resource management, RDT&E, and life-cycle management of CIE. The AR 700-86 acquisition process, therefor, is significantly different from that outlined in AR 70-1 and AR 71-9. Section E discusses the CIE acquisition process in detail, assessing its relevance to the Soldier System and USSOCOM.

3. Special Operations

Department of the Army (DA)-USSOCOM research, development and acquisition relationships are established in Annex D of the Memorandum of Agreement (MOA) between DA and USSOCOM. The MOA explicitly describes USSOCOM-DA interface under AR 70-1, including USSOCOM representation on Army Systems Acquisition Review Councils (ASARCs), MOAs with specific Army programs, funding, and proponency. The scope of the MOA, however, is limited to "standard items used by other DoD forces, but modified for SOF, and items initially designed for, or used by, SOF but subsequently considered for standardization" by the Army. [Ref. 24:p. 2] No special provisions are made in the MOA for SOF input into the long range development of standard issue Army items, or into the AR 700-86 CIE process.

C. ACQUISITION PROCESS: AR 70-1

1. Background

a. Combat and Material Developers

The need for a new system and the planned start point for full scale development are determined in light of continuing assessment of the threat, capabilities of existing systems, planned improvements and upgrades, and user priorities. This ongoing assessment integrates the work of the two traditional Army counterpart functions, "combat development" and "material development." The Combat Developer is a command or agency that "formulates doctrine, concepts, organization, material requirements, and objectives." [Ref. 21:p. 91] In the acquisition process, the combat developer is referred to as the "user" or the "user representative." [Ref 22, p 6] Under AR 70-1, DA Staff proponency for combat developments is the Deputy Chief of Staff for Operations (DCSOPS) and, for medical items, The Surgeon General (TSG). [Ref. 21:pp. 7-9]

The "material developer" is the research, development and acquisition command or agency assigned responsibility for RDT&E and Procurement of the system. [Ref. 21:p. 91] Department of the Army AR 70-1 material development authority is the Army Acquisition Executive (AAE) - currently the Assistant Secretary of the Army (Research, Development, and Acquisition) (ASA(RDA)) - as delegated from the Secretary of the Army and Defense Acquisition Executive (DAE). [Ref. 25] Army implementation of the DoD 5000.2 milestone

review process and decision authorities for Army AR 70-1 programs are summarized in the tables in Appendix D.

b. Long Range Planning

Both the combat and material developer coordinate extensively with the Army Staff and each other as essential to long term success. The material developer maintains the Army technology base to "anticipate correcting deficiencies and to increasing capabilities." [Ref. 21:p. 12] Technology base research and development is guided by the Department of the Army (DA) Long Range Research, Development, and Acquisition Plan (LLRDAP), the Mission Area Material Plan (MAMP), and Extended Planning Annex (EPA), each of which covers the next 17 years. Combat developers conduct mission area analysis (MAA) to assess the "capability of a force to perform within a particular battlefield," the results of which are summarized in the Battlefield Development Plan (BDP). [Ref. 21:p. 12] The BDP leads to specific functional area Modernization Plans. "When the MAA process reveals a battlefield capability issue, the combat and material developer jointly assess the best method to establish a capability in response." [Ref. 21:p. 12] Thus, the LLRDAP/MAA and MAMP/BDP are mutually supportive. They are the principal documents for the Army acquisition POM/PPBS process. [Ref. 21:p. 13]

c. Technology Base

The LLRDAP and MAMP shape the Army's Technology Base Master Plan, the goal of which is to channel resources into the best areas to achieve "balanced overall capability to meet current

and future threats." [Ref. 21:p. 17] A large share of these resources go into Advanced Technology Transition Demonstrators (ATTDs), a mix of "prototypes, components, surrogates, and simulations." ATTDs serve three functions. [Ref. 21:p. 17] They demonstrate that the technology barriers that inhibit low-risk full scale development have been overcome, develop data to support realistic cost estimates, and provide practical proof of principle for the technical approach to the operational concept. A successful technology base program works to reduce technical risk and avoid costly false program starts, and to "set the stage for further streamlining the development process without increasing overall risk." [Ref. 21:p. 17]

d. Mission Needs Statement

The combat developer, with the support of the material developer, has the lead responsibility for the concept and requirement formulation process. [Ref. 22:p. 3] This process begins when the combat developer establishes that all non-material solutions have been "impartially evaluated and eliminated" as viable alternatives to a material problem, and the material developer provides documented proof (usually through ATTDs) to verify that "at least one option can be ready for near-term engineering development." [Ref. 21:p. 17] According to AR 70-1, an Operational and Organizational (O&O) Plan, or, if required by DoD 5000.2, a Mission Need Statement (MNS) is then prepared.

As a separate program, the Soldier System has reached this point in the documentation process. The eight Next Generation

systems of the Soldier Modernization Plan Block I, however, have passed this stage of development as elements of PEO and AMC managed programs. Current Soldier System program management responsibilities are discussed below in Sections D and E.

2. Soldier System Status

The current Soldier Modernization Plan, when signed, might quickly lead to an approved O&O Plan. The critical difference between the two documents is in scope. An O&O Plan is a "pure" material requirements document, while the SMP contains additional training and doctrine guidance. The O&O Plan is normally considered to be the material program initiation document because of the activities it sets in motion. [Ref. 22:p. 7] The next steps under AR 70-1 are outlined below as a guide to possible Soldier System developments over the next 24 months.

The O&O Plan approval authority, and therefor the scope of the Soldier System program charter, however, depends on the resolution of at least two currently unanswered questions. First, as outlined in Chapter II, is the actual funding levels dedicated to the Soldier System. Funding levels largely determine the acquisition category. Under Public Law, any program estimated to require an eventual total expenditure of more than $300 million for RDT&E or $1.8 billion for procurement in FY 90 constant dollars is a Major Defense Acquisition Program; $115 million for RDT&E or $540 million for procurement constitutes a Major System. [Ref. 19:pp. i-ii] Second, as described in Sections D and E below, is the outcome of the reorganization of the traditional management responsi-

bilities and processes for acquiring medical and non-medical items under AR 70-1, and for acquiring clothing and equipment under AR 700-86.

3. Soldier System - Next Steps

An approved O&O Plan or Mission Need Statement begins the formal Concept Formulation Process (CFP) that ends with the statement of Required Operational Capabilities (ROC), the document that formally commits the Army to an acquisition program.[1] [Ref. 22:p. 8] The relationship of the CFP to the DoD Milestone timetable is shown in Figure 3-1, taken from AR 70-1.

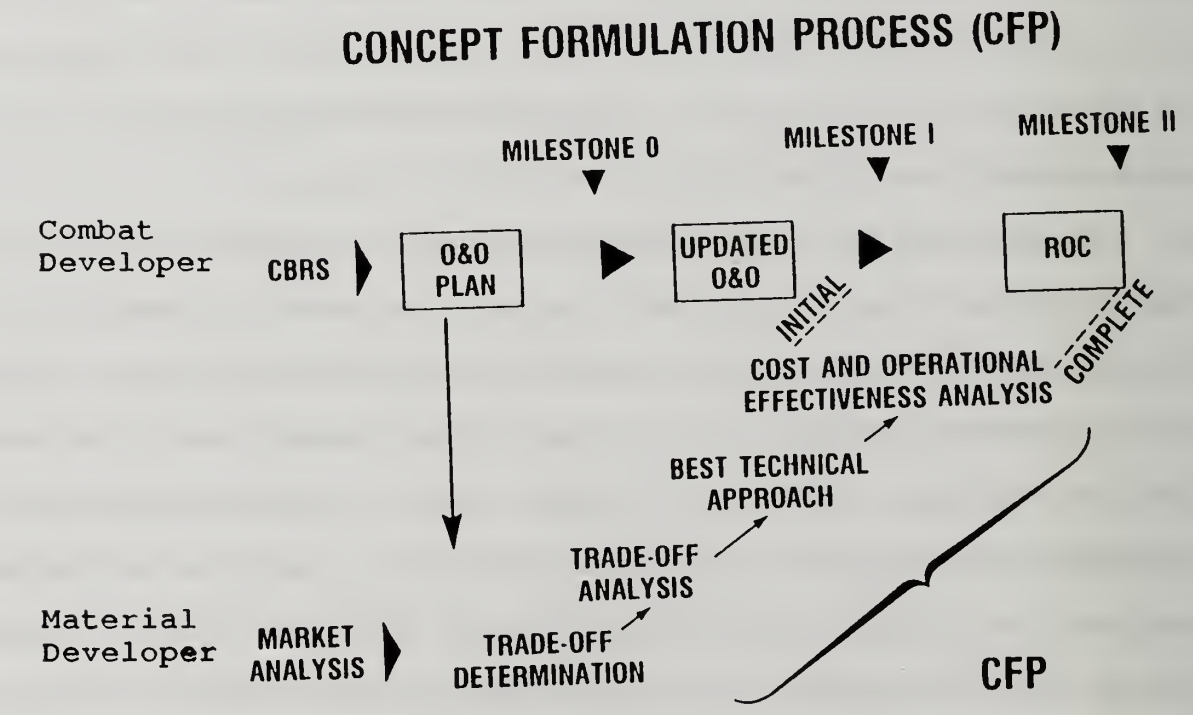


Figure 3-1: Concept Formulation Process (AR 70-1)

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[1] Army Regulations are currently being updated to conform to DoD acquisition terminology policy. In the next edition of AR 70-1, the ROC will become the Operational Requirements Document (ORD).

The CFP consists of four sequentially prepared documents. The material developer, supported by the combat developer, conducts a Trade-Off Determination to fully assess all material options. The combat developer then prepares a Trade-Off Analysis applying these options to threat and doctrine. The Best Technical Approach (BTA), in turn, is prepared by the material developer in response to these two studies. The BTA defines the operational, performance and supportability characteristics of the best and next best approaches, and refines the cost-schedule estimates. Based on the BTA, the combat developer conducts a Cost and Operational Effectiveness Analysis (COEA), the results of which are provided to the program decision authority to support milestone decision reviews. A complete ROC is required for Milestone II approval. [Ref. 22:p. 7]

AR 70-1 places extensive emphasis on tailoring this cycle to each specific program in order to streamline the process. Much of the technical analysis for the Soldier System has already been accomplished through current program management organizations; some is contained in the SMP. It is not clear, therefore, how long this process would take if the Army decides to designate the Soldier System as a major system.

Two additional observations from AR 70-1 and 71-9 are relevant to the development of the Soldier System. First, the approving authority for the initiation of an MDAP or ADAP program is the Secretary of Defense. [Ref. 22:p. 7] Thus, for the Soldier System to be designated as a Major System, another layer of review

authority - the Office of the Secretary of Defense (OSD) - must be briefed and approve.

Second, after O&O approval but before the formal establishment of a program office, program control is often exercised by a Special Task Force (STF) or Special Study Group (SSG), especially when the program is considered to be high risk, other Services are included, "a major resource impact is involved." or special expertise is required. [Ref. 22:p. 10] A Special Task Force is chartered by the Chief of Staff and supervised by the DCSOPS. A Special Study Group is chartered by the combat developer, often at the direction of the DCSOPS. Appointment of an STF or SSG is the next major step in the reorganization of Soldier System material development. Appendix E lists the composition of a Special Task Force.

4. Special Operations Considerations

The DA-USSOCOM MOA provides for USSOCOM membership on the ASARC and the Source Selection Board (SSB) for all Army managed MDAP and ADAPs with primarily SOF-peculiar applications, and for USSOCOM decision authority for Army non-Major programs being executed for USSOCOM. [Ref. 24:p. 3] Program specific MOAs will be negotiated in both of these situations. [Ref. 24:p. 4]

The Soldier System, however, is currently neither of these. Under the DA-USSOCOM MOA, the Soldier System interface options for USSOCOM are limited to preparation of an Operational Needs Statement submitted to HQDA and "monitoring" of the Soldier System program management office, once one is designated. The preparation

of an ONS is described in AR 71-9 paragraph 3-9. AR 70-1 paragraph 4-4 describes the approval process through the Chief of Staff, Army Acquisition Executive, and DCSOPS.

Two other options, however, have emerged over the past 12 months. One is direct participation with TRADOC and the US Army Health Services Command (USAHSC) in the combat development process. The other is USSOCOM coordination with the Army's technology base planners. This analysis is further developed in Chapter V (USSOCOM) and Chapter VI (Conclusions).

Options for USSOCOM input into the Army CIE acquisition process are discussed in Section E (CIE).

D. ACQUISITION RESPONSIBILITIES: AR 70-1

1. General Overview

Acquisition responsibilities within the Army generally belong to three different groups of organizations: the Secretariat and Staff elements of the Headquarters, Department of the Army (HQDA); the Army Acquisition Executive (AAE) - Program Executive Officer (PEO)- Program Manager (PM) (AAE-PEO-PM) chain; and the various major commands (MACOMs) and Agency level commands of the Army. Each grouping has significant responsibilities for every program. Specific responsibilities, however, vary depending on program milestone and decision authority. [Ref. 21:pp. 6-11]

For the Soldier System, combat development is done primarily by TRADOC, but the US Army Health Services Command (USAHSC) has significant subsidiary responsibilities for developing

medical requirements. The technology base is managed by AMC and the US Army Medical Research and Development Command (USAMRDC). After ROC approval, systems management responsibility will be passed from the STF or SSG to a PEO or AMC program manager, under AR 70-1. Combat development interface then often becomes the responsibility of a Training and Doctrine Command (TRADOC) Soldier System Manager (TSM-Soldier).

2. Department of the Army Level Responsibilities

Appendix F outlines the Soldier System related responsibilities within HQDA under AR 70-1. Although extensive coordination and input from each Staff and functional area is required, the Assistant Secretary of the Army (Research, Development, and Acquisition) [ASA(RDA)], the Deputy Chief of Staff for Operations (DCSOPS), and the Surgeon General are the most significant for non-CIE acquisition. The DCSOPS is the combat development and material requirement proponent for all non-medical items. [Ref. 21:p. 8] The Surgeon General is the focal point for all medical acquisition. [Ref. 21:p. 9]

The ASA(RDA) controls Army PEOs, programs the RDT&E and Procurement budgets, coordinates with the DAE and other Services, and is the decision authority for Army acquisition. [Ref. 21:p. 7]

ASA(RDA) supervision of Soldier System RDT&E is currently exercised through two standing committees. The Technology Base Advisory Group (TBAG) is the Army's senior RDT&E advisory body. Among its functions is establishing overall guidance for the various system specific Technology Base Executive Steering

Committees (TBESCs). Each TBESC is a coordinating body of ASA(RDA) appointed representatives from the technology base, user, and material developer communities. Soldier System TBESC membership is listed in Appendix G. [Ref. 15] USSOCOM representation on this TBESC was established March 1991. [Ref. 26] USSOCOM membership on the Technology Base Advisory Group (TBAG) is pending. [Ref. 29:p. 40]

Below the HQDA level, all acquisition responsibilities are divided into the two broad functional areas discussed above - combat development and material development.

3. Combat Development

a. TRADOC

(1) General. The Training and Doctrine Command (TRADOC) is the principal Army "combat developer" - the formulator of doctrine, concepts, organization, material requirements and priorities, and user representative during the acquisition process. [Ref. 21:p. 10] As noted, TRADOC interface with HQDA and Army material developers is continuous and occurs through many channels, beginning with long range planning, through the concept development process, to the actual acceptance of material. This relationship with the material developer is often described as TRADOC "user pull" and AMC "technology push" for Army acquisition. [Ref. 27:p. 17-9]

TRADOC has four important channels to manage combat development, each relevant to the Soldier System: The Combined Arms Center (CAC) and Combined Arms Support Command

(CASCOM), TRADOC Systems Managers (TSMs), and the TRADOC Analysis Command (TRAC).

(2) CAC and CASCOM. The Combined Arms Center (CAC) and Combined Arms Support Command (CASCOM) coordinate and integrate the input from the 17 "branch" combat development centers (Infantry, Armor, Field Artillery, etc.), each co-located with the branch school headquarters and the focal point for feedback from Army units. Material proponency ("sponsorship") within TRADOC is usually established through CAC.

Prior to the "stand-up" of USSOCOM acquisition capabilities, completed in FY 91 and discussed in Chapter V, combat development for most Army Special Operations Forces (SOF) was the responsibility of three different TRADOC branch centers. Green Beret, PSYOP, and Civil Affairs needs were established by the John F. Kennedy Special Warfare Center and School (JFKSWCS) at Ft Bragg. Ranger combat developments were the responsibility of the US Army Infantry Center and School (USAICS) at Ft Benning. Special Operations Aviation requirements were developed by the US Army Aviation Center and School (USAAVCS).

JFKSWCS, now a part of the US Army Special Operations Command (USASOC) - simultaneously an Army MACOM and a subordinate command of USSOCOM - is now responsible for all Army SOF combat development. [Ref. 13:p. i] Army SOF combat development channels are discussed in Chapter V, but it is noted here that considerable "institutional memory" still exists for direct JFKSWCS-CAC-USAICS interface. USAICS, which still conducts the

Ranger and static-line Airborne courses as TRADOC schools, continues to exercise considerable interest in Ranger related material requirements through its responsibilities for all infantry combat development. [Ref. 5]

(3) TRADOC System Managers (TSMs). TRADOC System Managers (TSMs), usually an O6 level billet, are assigned to interface with the PEO or AMC program managers of a specific group of related critical material programs to maintain "user representation" throughout life-cycle development. The Army currently has 26 TSMs. [Ref. 31:pp. A102-6] In a few rare cases - some aspects of TSM-Soldier implementation of the Soldier Enhancement Program, for example - TSMs have taken a more active role in program decision making. [Ref. 6]

TSM-Soldier was established in June 1990 to both compile and update the Soldier Modernization Plan and to serve as liaison with the Soldier System material developer. [Ref. 7] At the time, it was thought that a single material manager would be established in FY 91. [Ref. 5] Because of its dual functions, the TSM-Soldier charter is somewhat broader than most TSMs. TSM-Soldier is mandated to:

> Serve as the conscience of the Army for the soldier and the Army's centralized manager and interrogator for all combat developments...associated with the soldier as a major battlefield system and the appropriate subsystems, to include the individual soldier, and everything he wears, consumes or carries for individual use in a tactical environment, including those items in the soldier's load...using the soldier modernization plan as the basis. [Ref. 7]

(4) TRADOC Analysis Command (TRAC). The TRADOC Analysis Command (TRAC), finally, maintains several field offices that analyze data from past operations and conduct simulations to test and explore future concepts, including material performance and solutions. Thus, TRAC both independently identifies potential developments and analyzes solutions to problems surfaced through CAC and CASCOM. TRAC conducts Technology Based War Games, such as the series that prompted the Soldier Modernization Plan, and also develops parts of the documentation supporting the concept formulation process.

b. Medical: USAHSC

The US Army Health Services Command (USAHSC), an Army Major Command (MACOM), is the Army medical combat developer, trainer and user representative for activities assigned by TRADOC and the Surgeon General. This includes developing doctrine, concepts, material requirements priorities and Mission Need Statements, personnel training, and conducting or supporting assigned Operational Testing. [Ref. 21:p. 11]

4. Material Development

a. AAE-PEO-PM Responsibilities

The Army Acquisition Executive is the "Senior Procurement Executive within the Army responsible for administering acquisition programs in accordance with DoD policy and guidelines." [Ref. 21:p. 6] The AAE's general function is overall guidance and review for Army managed programs. Specifically, the AAE assigns DoD selected MDAP and ADAP programs to a specific PEO for adminis-

tration, and ensures that "programmatic decision authority rests only in the AAE/PEO/PM chain" for these programs. The AAE approves and monitors each ADAP baseline. For non-major programs, the AAE will ensure that there will be "no additional management layers between the PM/program sponsor and the program decision authority." [Ref. 21:pp. 6-7] As stated, under DoD 5000.2, the Secretary of the Army is vested with AAE responsibility; AAE authority has been delegated to the ASA(RDA).

Program Executive Officers (PEOs) are responsible to the AAE for the "programmatics" (cost, schedule and performance status) and for the planning, programming, budgeting and execution of all assigned programs. [Ref. 21:p. 7] As discussed below, this PPBS responsibility is currently being transferred to PEOs from the Army Material Command (AMC), scheduled for completion in FY 93. [Ref. 28] Program Manager responsibilities, further specified in AR 70-17, can be summarized as "full line authority" for centralized management of a specific acquisition program. [Ref. 21:p. 7]

Although few elements of the SMP are currently assigned directly to a PEO, several PEO programs must be fully coordinated with the Soldier Modernization Plan. These include developing the next generation of armored vehicles (PEO-Armored Systems Modernization, 11 programs), Armaments (PEO-Armaments, one program), Aviation (PEO-Aviation, 8 PEO programs, and one direct reporting to the AAE), trucks (PEO-Combat Support, 3 programs), artillery (PEO-Fire Support, 12 programs), and radios and computers (PEO-Command and Control Systems, 4 programs). Without a single designated

material developer, proponents of the Soldier System contend that there is no focal point to systematically integrate the soldier's combat uniform and individual equipment with these systems. This same integration requirement holds for the AMC managed programs, discussed below.

b. AMC Responsibilities

(1) General. The Army Material Command (AMC) has three major material development responsibilities: (1) to manage Army Technology Base programs (6.1, 6.2, 6.3A funding categories) according to guidance from the ASA(RDA) and coordination with Army combat developers; (2) to provide direct functional ("matrix") support to PEO-PM managed programs; and, (3) to manage non-PEO procurement (6.3B, 6.4, etc.) programs. [Ref. 21:p. 9] The traditional fourth major AMC function - PPBS management of Army acquisition - is being transferred to AAE-PEO-PM management. [Ref. 28] AMC will retain this responsibility, however, for RDT&E and non-Major (non-PEO) programs. [Ref. 28]

(2) RDT&E. The US Army Laboratory Command (LABCOM), a subordinate command of AMC, has cognizance over the preponderance of the US Army non-Medical technology base. The Commanding General of LABCOM is simultaneously the Director, AMC Technology Planning. [Ref. 29:p. 39] Major technology base initiatives are coordinated through LABCOM with the AMC Staff and the office of the ASA(RDA). However, most research and development is actually conceived, programmed and managed by the various subordinate Research, Development and Engineering Centers (RDEC's) and laboratories after

direct coordination with the AMC functional area commands. [Ref. 10] Furthermore, Army technology base interfaces with the other Services, universities, and the private sector usually occur either through an ASA(RDA) chartered committee, such as a TBESC, or direct contact with an specific RDEC or laboratory. [Ref. 30] Thus, the program manager for a specific RDT&E program is usually assigned to one of the subordinate labs rather than directly to LABCOM. PM-SIPE at the Natick RDEC is one example. [Ref. 11]

For the Soldier System, ten AMC RDECs and laboratories are currently conducting supporting RDT&E. They are listed in Appendix H to illustrate the complexity of the management task and scope of research relevant to the Soldier System. The main goals of ASA(RDA), AMC and LABCOM oversight are cross-fertilization of ideas between labs and programs and maintaining a strong link between actual research and user need. [Ref. 10] As discussed below in Section E, the Natick RDEC has unique oversight for this purpose relevant to the Soldier System.

(3) PEO and PM Support. The second major function of AMC - providing matrix support to PEO programs - is accomplished through the six functional area ("commodity") commands within AMC. For Soldier System related programs, these are primarily the Troop Support Command (TROSCOM), the Communications and Electronics Command (CECOM), and the Armament, Munitions and Chemical Command (AMCCOM). [Ref. 5]

(4) AMC Program Management. AMC management of non-PEO programs - the third major function of AMC - is done both through

"direct reporting" program managers and through program managers at the functional area commands. [Ref. 27:p. 17-8] The program charter for each AMC program specifies the reporting relationship. [Ref. 21:p. 5] Direct reporting program managers essentially answer directly to the Commanding General of AMC. Matrix support relationships vary, but most are directly supported by a single functional area command. Program managers within the commodity commands answer through the commanding general of that command. The intent of DoD guidance to maintain no more than one level of management between the decision authority and program manager is maintained, however, as shown in the table in Appendix D. [Ref. 21:p. 32]

All AMC managed programs are currently categorized as Nonmajor Level II or III; the program decision authority is either the Commanding General, AMC, or the commander of the commodity command. [Ref. 21:p. 32] In general, AMC managed programs are either new acquisitions of relatively small dollar cost, or older major programs nearing the end of the product life-cycle, thus falling out of PEO purview. [Ref. 25] AMC currently manages 37 procurement programs (contrasted with 135 under the 11 PEOs and 8 directly reporting to the AAE). [Ref. 31] The most relevant to Soldier System integration are PM-Fixed Wing Aircraft, PM-Light Armored Vehicles, PM-Light Observation Helicopters, PM-Armored Combat Earthmover, PM-M113/M60 Family of Vehicles, PM-NBC Defense Systems, PM-Training Devices, and, most significantly, PM-

Clothing and Individual Equipment (PM-CIE), discussed in Section E. All are direct reporting AMC programs.

The AMC Troop Support Command (TROSCOM), in addition to providing matrix support to PM-CIE, manages the Soldier System field service, ration, and airdrop projects. The Objective Family of Small Arms program is under the Armaments, Munitions and Chemical Command (AMCCOM). The Communications and Electronics Command (CECOM) manages the night vision, radios, and Global Positioning projects for the TEISS program. [Ref. 30]

c. Medical Responsibilities: USAMRDC and USAMMA

The US Army Medical Research and Development Command (USAMRDC) is the Army medical material developer. In addition to medical RDT&E and Procurement management, USAMRDC must coordinate with AMC and provide PEO matrix support to integrate medical RDT&E into Army material programs. [Ref. 21:p. 11] USAMRDC is specifically charged with primary responsibility to maintain a "responsive" biomedical science and technology capability for injury and illness prevention and treatment, developing skin decontamination products, and correcting soldier vision. [Ref. 21:p. 11] Army medical RDT&E is conducted in the nine laboratories under USAMRDC. [Ref. 2:p h-1] The most significant to the Soldier System is the US Army Research Institute of Environmental Medicine (USARIEM), the primary DoD facility for human physiology, environmental medicine, and military nutritional research. [Ref. 12]

The US Army Medical Material Agency (USAMMA) has logistics responsibilities for medical material acquisition similar

to the US Army Logistics Evaluation Agency (see Appendix F), and is further charged with managing medical NDI programs. [Ref. 21:p 11]

E. ACQUISITION PROCESS AND ORGANIZATION: CIE

1. CIE Acquisition

a. Background

Although seven of the eight Next Generation systems covered in the Soldier Modernization Plan are managed under AR 70-1, the cornerstone SIPE ATTD and TEISS programs are currently managed under AR 700-86. Furthermore, more than half of the specific items in the current SMP are classified as CIE, although this percentage might decrease when the updated version of the SMP is approved. As stated in the discussion of the regulatory basis in Section B and Appendix C, CIE covers uniforms and load bearing equipment, but not all CIE belongs to the Soldier System. As mentioned, of the 24 uniform systems managed under AR 700-86, only seven - the three versions of the battle dress uniform (BDU), the hot and cold weather uniforms, the flight uniform, and the combat vehicle crewman uniform - are included in the SMP. AR 700-86 provides for a CIE acquisition process markedly different than the AR 70-1 system. This greatly complicates implementation of the SMP, designation of the Soldier System as a Major System, and the pathways for USSOCOM-Army interface.

The current CIE management process resulted from the mid 1980's reorganization of the former US Army Material Readiness Command (DARCOM) Commodity Management Office - CIE, itself a

modification of even more traditional Army practices. [Ref. 20:p. 3]

b. CIE Acquisition Framework

Proponency and procurement budget oversight of the procurement and supply management of CIE have remained the responsibility of the Deputy Chief of Staff for Logistics (DCSLOG) proponent office, as opposed to the DCSOPS and ASA(RDA) under AR 70-1. RDT&E direction and funding, however, are exercised by the ASA(RDA) as coordinated with the DCSOPS. TRADOC is the principal combat developer, but AR 700-86 specifies a unique Statement of Needs process for CIE items (SN-CIE). The old Clothing Advisory Group (CAG), not the DCSOPS, remains the requirement validation authority. Most significantly, the traditional Army Clothing Equipment Board (ACEB), chaired by the DCSLOG, is still the program decision and review authority, with formal approval for all uniform modifications retained by the Chief of Staff of the Army (CSA). [Ref. 23:pp. 3-5] ACEB and CAG membership is listed in Appendix I.

c. PM-CIE

Material development, including managing RDT&E, is the responsibility of the Program Manager-CIE (PM-CIE), following the decisions of the ACEB. Although PM-CIE is designated as a direct reporting AMC program manager receiving technical matrix support from TROSCOM, PM-CIE's charter resembles the scope of the old commodity manager more closely than that of other AMC program managers. PM-CIE is chartered under AR 700-86 to manage "all CIE life-cycle development, technical testing and coordination of user

testing, fielding and issue, maintenance, and disposal" - that is, with RDT&E, procurement and supply functions. [Ref. 23:p. 5] In addition to answering to the ACEB, this is to be accomplished through several unique acquisition relationships and responsibilities.

PM-CIE is vested with policy control and supervision of the Natick RDEC in order to manage CIE technology base activities. [Ref. 23:p. 5] The RDT&E management process is similar to that in AR 70-1, with funding primarily through AMC from the ASA(RDA) managed RDT&E Program 6 (OCIE) account. [Ref. 23:p. 3] However, procurement funding, including funds for the PM-CIE executed Soldier Enhancement Program (SEP) [Ref. 14], is programmed by the DCSLOG in the OMA Programs 2, 7, and 8 and Military Personnel, Army (MPA) budgets. [Ref. 23:p. 4] In addition to SEP and TEISS funds, as shown in Chapter II, the AMC technical assessment calculates that PM-CIE currently spends about $9 million annually on Soldier System related RDT&E, and between $68.4 and $72.9 million for actual procurement. [Ref. 14]

In addition to material development, PM-CIE has the traditional supply responsibility of monitoring the Army CIE inventory, including policy supervision of the US Army Soldier Support Activity, Philadelphia (USATSAP). [Ref. 23:p. 8] Thus, AR 700-86 explicitly directs PM-CIE to maintain liaison relationships with the Army General and Special Staff, TRADOC, AMC, the Defense Logistics Agency, the Defense Personnel Service Center, the General Services Administration, and the Army Air Force Exchange System.

According to AR 700-86, therefor, PM-CIE's total funding profile is programmed both through AMC and the now non-existent PEO-Troop Support. It is budgeted in several Army Staff elements, including ASA(RDA), DCSLOG, DCSOPS, the Deputy Chief of Staff for Personnel (DCSPER), the Chief, Army Reserve (CAR), and the Director, Army National Guard (DANG). [Ref. 23:p. 4]

Medical RDT&E and CIE development, however, remains outside this process as the responsibility of the Surgeon General. PM-CIE must coordinate for the integration of medical items to be worn as part of soldier CIE with USAMRDC, subject to the approval of the DCSPER and DCSLOG. [Ref. 23:p. 4]

2. Significance to Soldier System

a. Decision Authority

In addition to the unique Procurement funding process, the primary significance of the CIE process to the Soldier System is that many Army elements with no acquisition responsibilities under AR 70-1 currently exercise considerable influence over the decision to transition Soldier System programs from Concept Exploration to Engineering and Manufacturing Development and beyond. These include the DANG, the CAR, the Deputy Inspector General, the DCSPER, the "senior female officer on the Army General or Special Staff," and the Sergeant Major of the Army - six of the eleven voting members of the ACEB. [Ref. 23:p. 11] The CAG has similar representation, as well as senior female and enlisted representatives from the Army's major troop commands. [Ref. 23:p. 12]

Inclusion of these elements in the program approval process is intended to enhance direct and broad-based user input and control over Army uniforms. [Ref. 23:p. 1] The CAG and ACEB are probably well suited to decide whether or not to adopt black shoulder boards to replace the current green ones on the Class B uniform. These two boards are manifestly not appropriate, however, to assess the Soldier System on technical and programmatic grounds. As the Army begins to implement the SMP, it is doubtful that the senior Army and OSD leadership will allow them to exercise control over such a significant acquisition funding profile, regardless of the past merits of this approach. It is also doubtful that the Soldier System program manager, when one is designated, will be subject to both ASARC and ACEB review for components of the same system.

b. Requirement Documentation: SN-CIE

The AR 700-86 process does provide for a considerably less formal process for developing statements of need. The Statement of Need-CIE (SN-CIE) essentially performs the function of the AR 70-1 ROC with much less documentation. [Ref. 23:p. 13] The SN-CIE takes two forms, one for new CIE concepts such as TEISS, and another for modification of current CIE, such as some SEP issues.

Every SN-CIE consists of three parts. Part I outlines the concept or modification, and is reviewed by the TRADOC CIE Concept Working Group (CWG). Part II is the technical assessment and basis of issue plan, developed by AMC after CWG approval of Part I. Part III is the TRADOC-AMC jointly proposed Test and

Evaluation Master Plan. For modifications of existing CIE, this process can be very short. Following completion of testing, the SN-CIE is type classified and submitted to the CAG. CAG recommendations are passed to the ACEB for program approval. [Ref. 23:pp. 12-14]

c. Soldier System - Next Steps

As indicated, the Soldier System cannot be designated a Major System under AR 700-86. The TEISS program, however, is moving forward managed by PM-CIE. The next step for the Soldier System is to clearly delineate which CIE items belong to the Soldier System, and establish a mechanism to coordinate TEISS approval with the decision authority for the other seven Block I Next Generation systems. This has not yet been done.

3. Significance to Special Operations

AR 700-86 paragraph 7-7, "CIE requirments for special operations forces," restates the unprogrammed urgent requirement provisions of AR 700-9 paragraph 2-3, but no special provisions are made otherwise for submitting long range SOF material requirements to the ACEB. Nor does the DA-USSOCOM MOA cover the AR 700-86 process. USSOCOM options regarding Army CIE are discussed further in Chapter V (USSOCOM) and Chapter VI (Conclusions), but are essentially no different than those under AR 70-1.

G. CONCLUSION

The Soldier System clearly does not fit into the Army's established process for acquiring items worn, carried and consumed

in combat. This was manifestly clear by the beginning of FY 91, prompting the Chief of Staff to charter the Army Science Board (ASB) to analyze the situation and make specific recommendations. The findings and recommendations of the Army Science Board study are summarized in Chapter IV. Chapter V (USSOCOM) is included as a reference for those unfamiliar with USSOCOM acquisition authorities and objectives.

IV. ARMY SCIENCE BOARD SUMMER STUDY

A. INTRODUCTION

This Chapter presents the findings and recommendations of the Army Science Board's Summer Study on the "Soldier as a System," and discusses their relevance to both the next steps for the Soldier System and USSOCOM. The major recommendation is for the Army to thoroughly reorganize the acquisition processes outlined in the previous chapter by establishing a single Soldier System material developer chartered in accordance with AR 70-1. This recommendation is still being reviewed by the ASA(RDA). Most of the supporting recommendations, however, are already being implemented by the Army elements involved, and should be completed over the next 12 to 18 months. [Ref. 30]

The key recommendations are summarized in Part C. The six major issue areas analyzed by the ASB are discussed in Part D.

B. SCOPE AND METHODOLOGY

In January 1991, the ASA(RDA) directed that the Army Science Board conduct a "Summer Study" on the Soldier System, to be completed by the following September. TRADOC and AMC were designated as co-sponsors, and study participants were appointed by the ASA(RDA) with instructions to [Ref. 15]:

- Assess the existing RDT&E and Procurement process in relation to the soldier,
- Recommend the best management organization and approach, and
- Determine if the Soldier System should be managed as a major system.

The Chief of Staff further asked the ASB Summer Study to identify performance "leap-aheads" and enabling technologies, and to specifically address the issue of psychological and physiological interfaces. Following the completion of Desert Shield/Desert Storm, where many problems of CIE and individual soldier equipment integration were identified, the Chief of Staff enlarged the study's scope to assess ways for the Soldier System to improve the "quality of life for the soldiers in the field." [Ref. 14]

For the study, the Soldier System was defined to encompass "items and equipment worn, consumed or carried by the soldier in the field for personal use" plus "all that supports the living and working conditions of soldiers in the field." [Ref. 15]

C. KEY RECOMMENDATIONS

The ASB study fully endorsed the Soldier System concept. In its final briefing to the Army's senior leadership, the ASB made several specific recommendations for implementation in FY 92. Summarized in Figure 4-1, the supporting findings and recommendations are outlined in the six issue areas discussed below. Figure 4-2 shows the proposed Soldier System program organization recommended to the ASA(RDA).

AAE	Appoint a direct reporting General Officer to Manage the Soldier System as a Major System
ASA(RDA)	Establish an Army RDT&E focal point to manage the Soldier System technology base
Chief of Staff	Approve the SMP through Block I
DCSINT	Develop a scenario-based threat for the Soldier System
CG, TRADOC	Complete the Combat Development analyses through the Soldier System level

Figure 4-1: Key ASB Recommendations [Ref. 14]

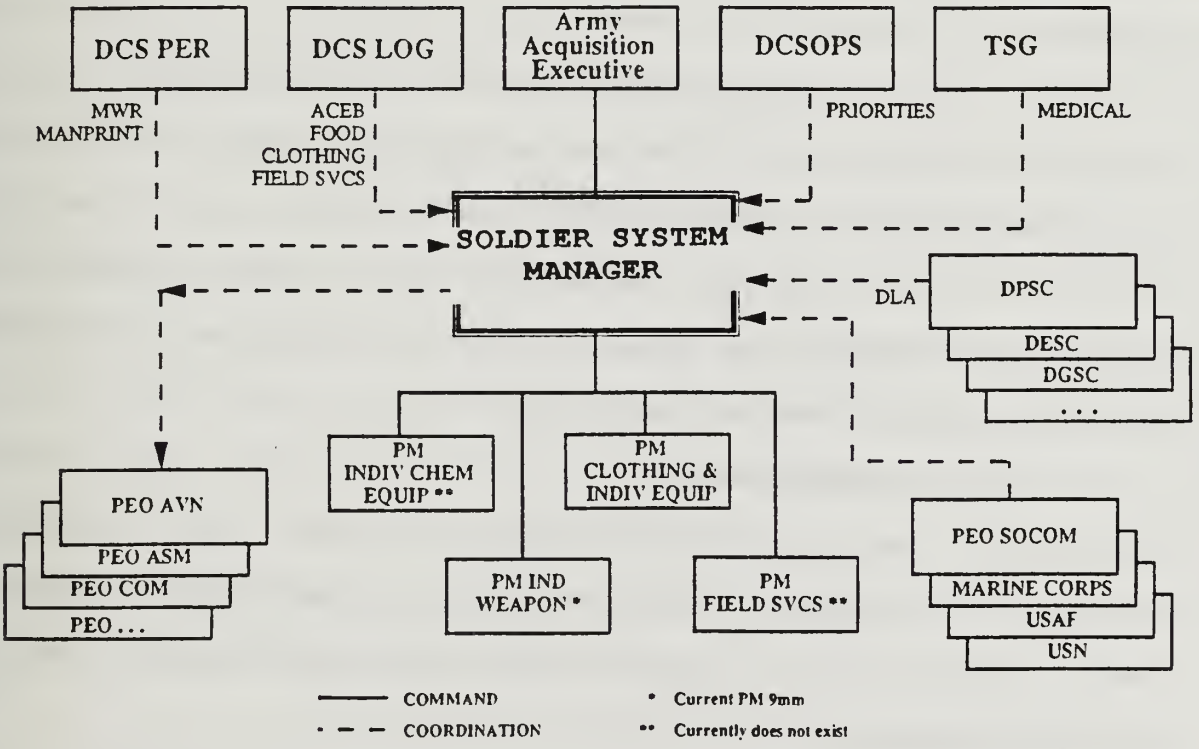

Figure 4-2: Proposed Soldier System Organization [Ref. 14]

D. SIX ISSUE AREAS: FINDINGS AND RECOMMENDATIONS[2]

1. Requirement Documentation

a) Findings:

(1) The Concept Based Requirement System (CBRS) process has not been completed for the Soldier System, especially concerning threat analysis. Likely Soldier System missions and tasks in the Soldier Modernization Plan (SMP) are not firmly linked to the scenario based threat analysis applicable to the individual soldier, nor has the intelligence community developed this analysis in the depth necessary to support the Soldier System as a major system.

(2) The analytic tools for performance analysis typical for major systems are not available for the Soldier System. The primary deficiency is in the area of simulation technology.

(3) Special Operations Forces (SOF), especially the Army's Green Berets and Rangers, provide strongest user pull for future Soldier System capabilities.

b) Recommendations:

(1) The Deputy Chief of Staff for Intelligence (DCSINT), in coordination with the Defence Intelligence Agency and TRADOC, must develop scenario based threat and analysis for future Soldier System.

(2) TRADOC should complete CBRS analysis for the Soldier System by 1992.

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[2] All findings and recommendations presented are paraphrased from Reference 14.

(3) TRADOC should develop and employ scenario based war games and simulations with greater emphasis on the future threat to the Soldier System.

(4) The TRADOC Systems Manager-Soldier (TSM-S) should "formally" coordinate with USSOCOM and other Services for requirements and resources.

c) Analysis

(1) Relevance to Soldier System. These findings support the key ASB recommendations to the DCSINT and Commanding General of TRADOC. The gap between current requirement documentation and technology base programs must be overcome in order for the Block I program to receive permission for full scale Engineering and Manufacturing Development, as outlined in Chapter III.

The threat to the individual soldier has not been analyzed in "depth," as mentioned in the first finding, in part because of the concurrent debate within the intelligence community over the most likely combat environment of the future, and in part because the traditional focus of intelligence supporting the acquisition process has been on weapon systems capabilities. Integrating this analysis to the level of threats to individual soldiers has not been done in the past.

The fourth recommendation (supported by finding 3) is intended to establish the groundwork for permanent, institutionalized links between USSOCOM, TRADOC and the material developer of the Soldier System.

(2) **Relevance to USSOCOM.** Recommendation number four offers USSOCOM a "window of opportunity" to fulfill the intent of its unique acquisition authority, outlined in Chapter V (USSOCOM). To accomplish this, however, USSOCOM must insure that its own requirements development and technology base process can properly identify and validate SOF needs.

2. **Acquisition Strategy**

a) Findings:

(1) Because of the incomplete requirement documentation, specific capability needs are not effectively influencing the material developers' current technology base investment strategy. Priorities given in the SMP are not sufficient for long range use.

(2) The current SMP establishes the Soldier System concept, and does provide an effective road map to the material developers for the Block I Soldier program.

(3) The Block II Soldier program in the current SMP is unrealistic and currently unfunded.

(4) Although the current SMP has not yet been formally approved, it is being used as a baseline document for both combat and material development. The SMP is critical to the current planning process.

(5) The total current Soldier System RDT&E and Procurement funding level is very difficult to assess - it may be as high as $200m per year.

b. Recommendations:

(1) TRADOC must develop a prioritized capability needs list for inclusion in the SMP.

(2) AMC should reevaluate the technology base funding plan based on an approved SMP. Soldier System funding should be centrally managed.

(3) The Army Chief of Staff should approve the SMP through Block I.

c) Analysis

(1) Relevance to Soldier System. The SMP will most probably be signed by the Chief of Staff in March 1992, but the other two recommendations will likely take more time to implement. As indicated in the first finding, prioritization depends on valid requirements and intelligence analysis, and therefore seems to be a FY 92/93 task. Centralized funding, as outlined in the previous chapters, is a very complex task that cannot be realistically accomplished until the senior Army leadership establishes a central Soldier System material developer.

(2) Relevance to USSOCOM. Army implementation of these three recommendations, in conjunction with proper USSOCOM requirement documentation, offers USSOCOM an even greater opportunity to leverage the Army Soldier System to meet SOF needs.

3. **Acquisition Management**

a) Findings:

(1) All soldier material items are interdependent.

(2) Currently no mechanism exists for critical trade-off analysis.

(3) There is currently no central organizational focus for material development. There are "multiple programs, multiple organizations, multiple systems, multiple technologies, and multiple kinds of soldiers," and thus limited power to affect outcomes across the whole system, despite the amount of money being spent.

(4) The TBESC charter is too narrow in focus to allow it to exercise central control over Soldier System RDT&E, and does not allow it any input into Procurement.

(5) The TSM-Soldier scope greatly exceeds all other TSMs, thus providing a forum for centralized material requirement development. The TSM-S, however, has insufficient resources and authority to assure material development success.

b) Recommendations:

(1) A General Officer or SES should be appointed to manage the material development and acquisition of the Block I and all follow on Soldier Systems. Current Soldier System related programs should be brought into one organization, and restructured within existing programmed resources.

(2) A focal point should be established to manage Soldier System technology base programs, including centralized funding.

c) **Analysis**

(1) **Relevance to Soldier System**. These findings are the most significant of the ASB study, and support the most far reaching recommendations. The future of the Soldier System as a Major System, and of effectively using the DoD systems engineering methodology to integrate items used by the individual soldier, fully depend on a single material developer being designated. This developer, furthermore, must have the authority to overcome the many institutional obstacles to effective integration outlined in Chapter III. The original ASB recommendation was for the AAE/-ASA(RDA) to designate an Army PEO for the Soldier System. Feedback from the ASA(RDA) convinced the ASB to formally recommend the structure outlined in Figure 5-2 as the ninth direct reporting AAE program office. The verbal recommendation to the ASA(RDA) was specifically that Soldier System management be taken out of AMC and placed under the AAE.

The ASB, however, made no specific recommendation on resolving the program duties and responsibilities differences between AR 70-1 and AR 700-86.

The second recommendation both supports the recommendation for a single material developer, and addresses the current TBESC weakness. The TBESC, as stated in Chapter III, has no control over Soldier System technology base funds, and thus

lacks the authority to implement its decisions. The intent of this recommendation to the ASA(RDA) is to end the "parochialism" found in the Technology Base Assessment, discussed below.

(2) **Relevance to USSOCOM**. For the individual Green Beret, SEAL and Ranger, Army implementation of these recommendations might be the single most significant material management development since the creation of USSOCOM. As provided for in the DA-USSOCOM Memorandum of Agreement, USSOCOM should immediately establish a direct relationship with this new program office, and negotiate USSOCOM representation on the program ASARC.

4. Technology Assessment

a) Findings:

(1) Near term, "leap ahead" advances are possible in Soldier System application of the Global Positioning System, advances in C3, aural sensors and chemical-biological protection.

(2) The current material development organization is insufficient to effectively leverage funds across the technology base community (DARPA, NASA, DoE, etc.).

(3) The current material development structure has a very limited peer review process - specific technology advocates dominate the alternative search process in many Soldier System technology areas.

(4) In the long term, some current Soldier System technology base research will offer great possibilities for increased combat capabilities, but some will be of only marginal value.

b) **Recommendations**:

(1) Proceed with near term and Block I modernization to capture currently available technologies, as outlined in the SMP.

(2) Set aside a $10m RDT&E funding "wedge" to invite and incorporate technologies from non-Army sources.

(3) Establish a formal interdisciplinary and independent alternative search process to review the RDT&E investment strategy.

c) **Analysis**

(1) **Relevance to Soldier System**. Again, the ASB assessment of Soldier System technology fully supports the Major Systems approach to acquiring soldier items. These findings and recommendations, however, are additionally intended as a warning of the risks incurred by not ending the current "parochial" approach to material development. Without more centralized program control, much of the projected RDT&E investment will be squandered.

(2) **Relevance to USSOCOM**. The near-term advances identified by the ASB have immediate SOF applications. The comments on limited peer review within the current RDT&E process are similar to many traditional SOF criticisms of Natick RDEC. USSOCOM should immediately take advantage of the Army's RDT&E resource invitation to leverage Army Soldier System dollars to acquire some of these near-term advances for selected SOF small units, and to further influence the Army's development process to meet SOF requirements. If possible, the USSOCOM science advisor

should become an accredited representative to the Army's alternative search process.

5. **System Architecture**

a) Findings:

(1) An integrated modular architecture for the Soldier System appears to be the best technical approach, and is currently the most effective way to coordinate and focus RDT&E investments.

(2) Many examples of current equipment interface mismatches exist, thus highlighting the problems with the traditional approach to acquiring soldier items.

3) Throughout the material development process currently in place, there exists an overall lack of system engineering methodology.

b) Recommendations:

(1) Focus Block I development on producing integrated modular equipment and consumable items.

(2) Apply the systems methodology to all aspects of Soldier System material development.

c) Analysis

The relevance of these findings and recommendations are discussed together with those concerning the SIPE ATTD program.

6. **SIPE ATTD Program**

a) Findings:

(1) Tests scheduled for 1992 are an important step towards soldier modernization and modular technology development,

but are not extensive enough to determine the value of any particular sub-system.

(2) No clear SIPE program exit criteria exist.

(3) Overall, the SIPE program has been well managed.

(4) Several individual modular components appear realistic - low technological risk and affordable - for engineering and manufacturing development in the mid-term.

b) **Recommendations**:

(1) Establish SIPE program exit criteria.

(2) Redesign the test program to delineate high/low payoff technologies at modular sub-system level.

(3) Conduct a more rigorous risk analysis to identify obstacles to success.

c) **Analysis**

(1) **Relevance to Soldier System**. The proposed Soldier System architecture and supporting SIPE program recommendations both endorse the current modular approach to systems integration and reinforce the criticism of the current RDT&E process found in the technology assessment. Future RDT&E must be firmly linked to valid user requirements and programmatic risks must be identified prior to approval for transition out of the technology base. In reality, these ASB findings and recommendations mean that the Soldier System Block I will not be ready for Milestone II/III approval until at least FY 94, and that procurement and fielding will occur in modules over several years. The integrated helmet and weapon, for example, might be in the inventory many years

before the complementary climate controlled body armor is ready for issue.

(2) **Relevance to USSOCOM.** The specific ASB criticisms of the SIPE program are essentially the same as those expressed by USSOCOM. This dissatisfaction with SIPE led to the two year USSOCOM sponsored Battle Dress System (BDS) technology base program at the Human Engineering Laboratory (HEL) in FY 91, discussed in Chapter 5 (USSOCOM). Implementation of these recommendations, in conjunction with the others to end Army Soldier System parochialism and establish coordinated control over all material development, might enable USSOCOM to meet SOF requirements through Army channels and by leveraging Army resources.

V. US SPECIAL OPERATIONS COMMAND ACQUISITION PROCESS

A. INTRODUCTION

The US Special Operations Command (USSOCOM) is the centerpiece of a larger effort initiated by Congress in the mid 1980's to revitalize the ability of the United States to conduct special military operations. Among the command's many functions is rectifying a gap that has always existed in the method traditionally used to equip special operations forces. USSOCOM has both combat and material development proponency for "Special Operations (SO)-peculiar" items used by its assigned forces, and budget responsibility for RDT&E and Procurement of such items. The period 1987-92 was designated as the "crosswalk" phase to transfer these functions and budgets from the Services to USSOCOM. Beginning in FY 92, USSOCOM has full POM responsibility for the acquisition of SOF peculiar items.

By almost any measure, these changes have been for the better. In the long term, centralizing acqusition authority is probably the best way to achieve the intent of Congress. Even in the short run, it has facilitated a higher material readiness level of US special operations units.

Several issues, however, have yet to be sorted out. The ultimate success of USSOCOM acquisition depends on their eventual resolution. USSOCOM interface with the Army's Soldier System is a good example. Foremost among these issues are the long-term execution of the USSOCOM combat development and validation process, integrating these requirements with the plans of the Services, and effectively monitoring of material programs executed in part for USSOCOM by the Services.

Analysis and specific answers to the research questions are presented in Chapter VI. This chapter presents supporting background information. Part B (SOF Organization) briefly discusses the organization of special operations within the US force structure. Appendix J presents greater background detail for the general reader on special operations, including specific missions, forces, operational characteristics, and the researcher's analysis of emerging SOF roles in national defense. Appendix K lists the desired general "opertational characteristics" of SOF equipment. Parts C (Authority) and D (Concept) outline the general USSOCOM approach to acquisition. Parts E (Combat Developments), F (Transition to Material Development), and G (Material Development) elaborate on the USSOCOM acquisition process. Part H (Current DA-USSOCOM Contacts) reviews the major events over the last 24 months relevant to USSOCOM interface with the Soldier System.

B. SOF ORGANIZATION

1. General

In 1987 Congress legislated a new organizational and management structure for special operations: an Assistant Secretary of Defense (Special Operations and Low Intensity Conflict) [ASD(SO/LIC)], a United States Special Operations Command (USSOCOM), and a separate major force program for special operations (MFP-11). [Ref. 32:p. 3] As stated, Appendix 5-1 provides a more detailed definition of "special operations" and the forces and mission involved. The primary functions of the ASD(SO/LIC) are to coordinate DoD policy on special operations and execute MFP-11 budget proponency. [Ref. 30]

2. USSOCOM

USSOCOM is the headquarters for all DoD special operations. Located at MacDill AFB in Tampa, FL, and commanded by a four star general officer (the Commander-in-Chief, Special Operations Command), its assigned missions and forces reflect the requirement to provide viable military options that fall between formally declared war and passive response to policy makers dealing with difficult international situations.

USSOCOM assigned forces include all Active and Reserve Special Operations Forces (SOF), Psychological Operations (PSYOP) units, and Civil Affairs (CA) units based in the United States. SOF include: Army Special Forces (Green

Berets), Army Rangers, Army Special Operations Aviation units, Navy SEALs, Navy Special Boat Units, and Air Force Special Operations units.

Each Service has a major subordinate command assigned and answerable to USSOCOM. All CA and PYSOP forces and Army SOF units are assigned to the United States Army Special Operations Command (USASOC), an 09 command headquartered at Ft Bragg, NC. Navy special operations units belong to the Special Warfare Command (NAVSPECWARCOM), and Air Force units to the 1st Special Operations Wing (1st SOW) of the 23rd Air Force (also titled AFSOC).

The USSOCOM headquarters staff has several Directorates designed to assist in conducting operations and managing resources. Many are involved in the acquisition process, including the Directorates of Resources (J8), Joint Studies (J5), Modernization Planning (J5-7), Operations (J3), and the Special Operations Research, Development and Acquisition Center (SORDAC). In addition, the staff of each Service subordinate command performs similar functions and interacts with the USSOCOM staff.

3. MFP-11

Major Force Program - 11 covers all the direct expenses of these units, including acquiring SO-peculiar equipment and services. [Ref. 33:p. 3-2] Indirect expenses are paid by the Services. The total MFP-11 obligational

authority for FY 90 was $3.381 billion; FY 91 was $2.511b; FY 92 and 93 are $3.007b and $2.724b, respectively. [Ref. 34] Of this, $168m was RDT&E in FY 90, and $191m in FY 91. RDT&E spending in future years is programmed at $276m (FY 92), and $267m (FY 93). [Ref. 35:p. III] Of these funds, however, only about $10m is now actually programmed and managed by the USSOCOM technology base program manager. [Ref. 30] A much larger amount is spent each year on actual procurement, although the precise dollar figure is classified. [Ref. 30] MFP-11 technology base funds are discussed below in Part G (Material Development).

C. ACQUISITION AUTHORITY

Title 10 United States Code, Section 167 provides the USSOCOM commander in chief with the responsibility to validate and prioritize SO-peculiar requirements, and to develop and acquire SO-peculiar equipment, supplies, and services. Public Law 100-180 amends Section 167 to add Head of Agency (HOA) status for the commander-in-chief, subject to the authority, direction and control of the Secretary of Defense. The implementing memorandum granting this under Chapter 137, Title 10 US Code, was signed by the Secretary of Defense on 4 May 1988. Subpart 202.1 of the Defense Federal Acquisition Regulation Supplement (DFARS) was adjusted to recognize this authority. [Ref. 36:pp. 2-3]

Significantly, HOA status includes the authority to establish a contracting activity and to join in agreements with other Agency Heads to delegate procurement functions and program management responsibilities. This gives USSOCOM the requisite authority to develop and acquire SO-peculiar equipment and thus improve the capability of assigned forces. [Ref. 36:p. 3]

D. ACQUISITION CONCEPT

1. Objectives

The intent of these changes is to insure that Special Operations Forces are adequately equipped to perform the full range of required missions, and to take the lead in research, development, acquisition and testing of equipment peculiar to special operations forces. [Ref. 37]

In essence, this intent requires USSOCOM to focus and integrate special operations programs which have, in the past, generally been unilateral Service efforts. This will lend priority to relatively inexpensive SO programs where total cost has not, by Service criteria in the past, been indicative of criticality and need for senior level supervision and management. [Ref. 32:p. 3-2] This also requires USSOCOM to prepare accurate program baselines defendable in the PPBS/POM process. [Ref. 37]

To meet this intent, the USSOCOM must accomplish three broad objectives within the DoD acquisition system. First is to field good sustainable equipment in the shortest possible time. The strategy and process for this is discussed below. In general, this is to be achieved by "maximizing" the use of the authority given. USSOCOM can tailor and streamline the process in-house to reduce the time required by developing a solid linkage between user, acquirer, and resourcer. The headquarters of all three are co-located in the same building. This ought to result in well articulated requirements, accurate cost estimates, and executable acquisition strategies in line with warfighting priorities. [Ref. 36:p. 4]

Second is to adhere to public law and Federal procurement policies. [Ref. 36:p. 5] Third is to develop clear channels of authority consistent with the DoD policy and regulations. [Ref. 36:p. 5] This is discussed below under management strategy. In general, however, USSOCOM must actively manage a small number of in-house programs and closely monitor other systems acquisitions executed by outside organizations to ensure USSOCOM needs are met.

2. **Management Strategy**

As stated, USSOCOM must validate, prioritize, program and fund all SO-peculiar requirements. SO-peculiar requirements are:

> Any item designated for, or primarily used by, Special Operations Forces in support of special operations missions. These include standard items used by other DoD forces, but modified for SOF, and items initially designed for, or used by SOF, but subsequently considered for standardization by other DoD forces. Criticality of need may also dictate the item to be SO-peculiar. [Ref. 24:p. 2]

Developing and executing a long term strategy consistent with the intent of Congress, however, has proven difficult. Over the last 36 months, USSOCOM acquisition authority has been used to satisfy near-term SO peculiar material requirements identified and programmed (usually with low priority) years earlier within the Services. Because of the "growing pains" of USSOCOM, less command emphasis has been placed on integrating the combat development process of Army, Navy and Air Force SOF units, and linking these combat developments to actual technology base research programs. [Ref. 30] As a result, the delineation of combat and material development responsibilities is not as clearly defined within USSOCOM as in the Army. Similarly, the issue of integrating "non-peculiar" SOF combat developments into the established Service processes has not been fully addressed. This latter problem is especially relevant to the Army Soldier System and USASOC-JFKSWCS, and is discussed at greater length below under combat developments.

The official USSOCOM command acquisition strategy, however, does define clear general guidance for material development.

First, for cost reasons, USSOCOM will use the existing Service and Agency acquisition systems whenever possible. [Ref. 36:p. 5] Executive Agreements between USSOCOM and the other Agency Heads, such as the DA-USSOCOM Memorandum of Agreement, have been negotiated to specify procurement and program management functions. [Ref. 29:p 7] Thus, USSOCOM delegates the majority of its acquisition duties. The decision criteria for delegation vice in-house material development are discussed below in Section F (Transition to Material development).

Second, because it is anticipated that most SO-peculiar requirements will be acquired by Service and Agency organizations through these agreements, USSOCOM has tailored its process to facilitate and monitor the SO related acquisition effort of these other organizations. [Ref. 37] Program Managers will be appointed only when no other organization can meet the stated USSOCOM objectives. [Ref. 36:p 6] USSOCOM program monitoring and management organization is discussed below in Section G (Material Development).

E. COMBAT DEVELOPMENT

1. Pre-USSOCOM Process

As discussed in Chapter III, prior to the legal establishment of USSOCOM acquisition responsibilities, combat development for Army SOF was performed by three TRADOC branch centers. Green Berets, Civil Affairs, and PSYOPS requirements were the responsibility of JFKSWCS; Rangers were covered by the Army Infantry Center and School (USAICS), and Aviation by the Army Aviation Center and School (USAACS). The work of each was integrated by CAC and CASCOM, approved by TRADOC and validated by the DCSOPS. (CIE requirements, as discussed in Chapter III, were validated by the DCSLOG and ACEB.) In the late 1980s, Army Regulations were updated to streamline this process for urgent SOF requirements. Combat developments for Navy and Air Force special operations units were also performed according to traditional service practices. [Ref. 30] Proponency for almost all items included in the Soldier System, however, was assigned to the Army. [Ref. 26]

Thus, establishing USSOCOM acquisition authority was followed not only by the creation of new acquisition offices at USSOCOM headquarters, but also by a concurrent reorganization of responsibilities within SOF subordinate units and the Services, especially the Army's TRADOC. The SOF related combat development responsibilities of USAICS and USAAVCS passed to JFKSWCS, although no personnel were reassigned to

maintain expertise. [Ref. 30] JFKSWCS was removed from TRADOC and assigned to the newly formed USASOC. Within USASOC, a process for approving JFKSWCS developments had to be established. The newly created USSOCOM subordinate special operations commands in the Air Force and Navy also had to redefine their special operations combat development processes. The new procedures in all three Services had to be integrated with requirements identified through other channels at USSOCOM for requirement validation and program funding.

In addition to the concurrent problems associated with the "crosswalk" of funds from the Services to MFP-11 and the sharp learning curve from simultaneously reorganizing all three layers of the SOF chain of command, two additional organizational problems remain. Both directly impact on USSOCOM interface with the Soldier System. First, no formal mechanism has been established between Army SOF and TRADOC to replace the coordinating and integration functions previously performed by CAC and CASCOM. Second, potential capabilities up to 17 years in the future are difficult to identify as SO-peculiar. A large requirements overlap exists between SOF Aviation and USAAVCS, and between Green Berets and Rangers and USAICS. More detail on these overlaps for the Soldier System is given below in Section H (Current DA-USSOCOM Contacts).

2. Emerging USSOCOM Process

As indicated, SOF acquisition requirements are identified by the USSOCOM subordinate commands, the regional CINCs, the Joint Mission Analysis (JMA) process, or the USSOCOM staff Directorates. These requirements are normally developed from changes in targets and identified threats, technological opportunities, or from cooperative foreign ventures. For assigned Army SOF units, the emerging combat development channel between JFKSWCS, USASOC and USSOCOM is summarized in Figure 5-1. [Ref. 38]

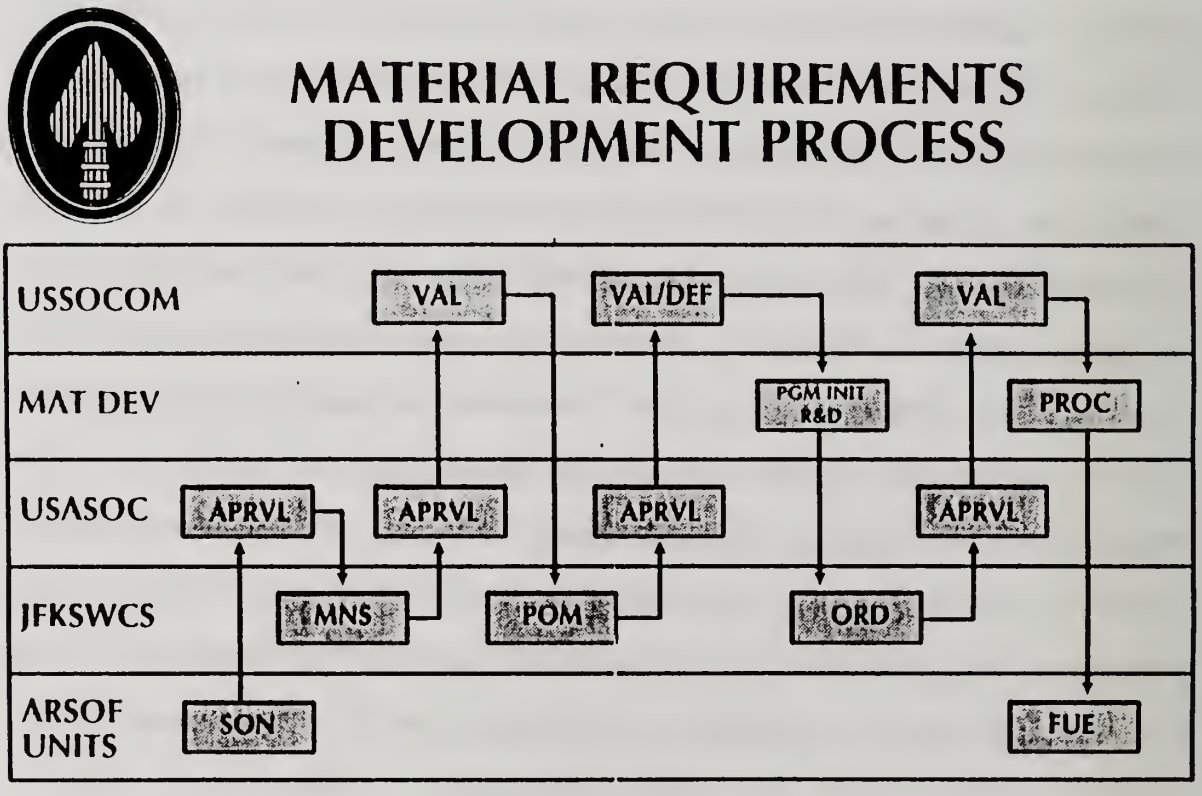


Figure 5-1: Army SOF Combat Development

USASOC approves Statements of Need (SON) submitted by subordinate Army special operations units; JFKSWCS then prepares the Mission Need Statement (MNS). Mission Need Statements are approved by USASOC and validated by the USSOCOM Operations Directorate Requirement Office (J3-R). For MFP-11 RDT&E and Procurement funded requirements, several USSOCOM staff directorates further review and integrate validated USASOC needs with other SOF requirements. For Soldier System items, this includes the Combat Development and Modernization Directorate (J5-7) and Directorate of Resources (J8). [Ref. 30] Final POM approval follows the recommendation of the appropriate USSOCOM acquisition review panel. [Ref. 39:p. 3-2]

The USSOCOM J5-7 is currently developing the master functional area Modernization Plans to coordinate and prioritize validated inputs from the various special operations communities, and to "matrix" these capability needs with the long range plans of the other Services and Federal agencies. [Ref. 37] When completed, these plans will be validated by J3-R and integrated into the MFP-11 POM and the SOF Technology Base Master Plan being developed by SORDAC. [Ref. 30] Because of the "growing pains" of USSOCOM, this process is far from complete, although it is critical to long term coordination with TRADOC. [Ref. 30]

Adoption of a specific acquisition strategy is discussed below in Section F (Transition to Material Develop-

ment), but it is noted here that under this process, enclosure in the MFP-11 POM starts the formal involvement of USSOCOM technology base and program management assets. [Ref. 39:p 3-1] The potential weakness with this late technology base involvement is discussed in Chapter VI (Conclusions).

Analysis of this process further highlights the two problems mentioned in the review of the pre-USSOCOM process and subsequent changes above. For Army units subordinate to USSOCOM, the only channel now available for introducing Statements of Need into the acquisition process is through USASOC. The majority of such input is not necessarily SOF-peculiar, and must eventually be passed to TRADOC. In reality, especially for individual soldier items, this means coordinating Army SOF needs with USAICS and TSM-Soldier. Recommendations for improving the current USSOCOM requirements process for this is discussed in the next chapter.

F. TRANSITION TO MATERIAL DEVELOPMENT

After requirements are identified and resourced through the MFP-11 POM/PPBS process, the USSOCOM Commander-in-Chief (in his capacity as the Special Operations Acquisition Executive) coordinates with the Under Secretary of Defense (Acquisition) (the Defense Acquisition Executive) and interested Service and Agency Acquisition Executives to determine the acquisition strategy for each SO-peculiar program or

project. [Ref. 36:p. 4] The ASD(SO/LIC) function is to monitor and facilitate DoD level coordination. [Ref. 30]

SO-peculiar items which appear to have joint Service common applications will normally be submitted to the Joint Requirements Oversight Council (JROC). [Ref. 37] As discussed earlier, all Major Defense Acquisition (Acquisition Category I) Programs will be executed by a lead Service or Agency because of high overhead costs. [Ref. 36:p. 3] USSOCOM will assign a Program Monitor to each SOF relevant Category I program. [Ref. 36:p. 3] Programs of lower Acquisition Category, usually III and IV or NDI, may be managed by USSOCOM "in house." [Ref. 37]

G. MATERIAL DEVELOPMENT

1. General Overview

The commander in chief of USSOCOM is the Special Operations Acquisition Executive (SOAE). The material development relationship within USSOCOM is summarized in Figure 5-2. [Ref. 37]

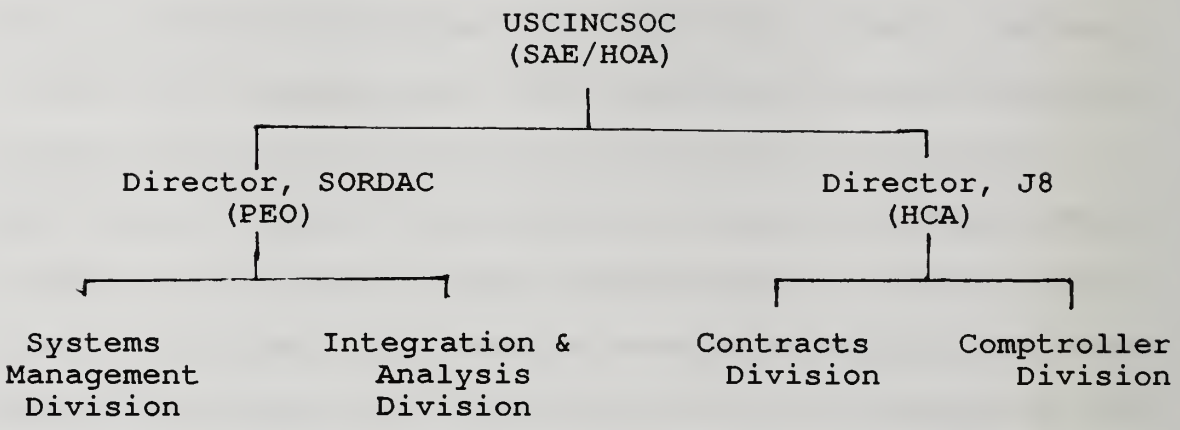


Figure 5-2: USSOCOM Material Developers

2. J8

Until late in FY 91, SORDAC was a subordinate office within the Resources Directorate, J8. [Ref. 30] The Director of Resources, a flag officer position, provides procurement support to USSOCOM in the capacity as Head of Contracting Authority (HCA). Contracts for direct USSOCOM acquisition and memoranda with Government engineering centers, therefor, are negotiated and managed by J8, among its other responsibilities. [Ref. 36:p. 3] The J8 Directorate currently consists of the Comptroller and Contracts Divisions. The Comptroller Division prepares and oversees the USSOCOM budget. The Contracts Division is responsible for providing overall support to USSOCOM for goods, services and material, as well as developing and ensuring compliance with USSOCOM contracting policies and procedures. [Ref. 40]

3. SORDAC

a) General Overview

The head of the Directorate of Special Operations Research and Development Center (SORDAC), an SES appointed in October 1991, is the Special Operations Program Executive Officer (SOPEO). The Director has staff responsibility for the centralized management and monitoring of assigned programs. All in-house acquisition activities and personnel report to this official. [Ref. 37]

The function of SORDAC is to provide research, development, and acquisition support to the activities and commands of USSOCOM. The SORDAC "plans, directs, reviews, and evaluates material development and acquisition" upon receipt of valid requirements developed in the process described above. [Ref. 36:p. 7] In reality, this can be divided into two functions - managing and monitoring acquisition programs and managing the technology base. The organization and authorized strength of SORDAC is given in the wire diagram in Appendix L. [Ref. 37]

b) Program Management

Program Managers and Monitors are part of the Systems Management Division and report directly to the PEO. As indicated, Program Managers execute selected non-major SO-peculiar system acquisitions and technological base developments. Program Monitors evaluate program baselines, strate-

gies and progress within the framework outlined by executive agreements between the USSOCOM and other Services and Agencies. The Integration and Analysis Branch provides matrix support to the Program Managers and Monitors. [Ref. 37]

The Systems Management Division currently has 16 personnel assigned to program management and monitoring. [Ref. 30] On the average, each is responsible for 30 projects. [Ref. 41]

c) Technology Base

(1) General Overview. The second major function of SORDAC is to insure that future special operations forces are equipped at the leading edge of technology. Thus, in addition to program management, SORDAC executes advanced technology, low-density, SO-peculiar prototyping through direct agreements with Government laboratories, universities, and the private sector. These programs are usually low dollar, low risk ventures, and may eventually be turned over to a Service or Agency if research and development results indicate common Service applications. In addition, a SORDAC technology base Program Manager (PM-Technology Base) monitors the technological base efforts of the Service, Agency and National Laboratory Systems. This enables USSOCOM to take advantage of non-system specific efforts that have direct SO application, or might have application if the technological development is modified. [Ref. 37]

As stated, MFP-11 funds during the five year transition period were those "crosswalked" from special operations programs in the Service and Office of the Secretary of Defense POMs. This transition of funds to the MFP-11 account, unfortunately, did not include money to establish an MFP-11 technology base program. [Ref. 29:p 5]

The funds subsequently made available were from an ASD(SO/LIC) managed 6.3A project called Explosive Ordinance Disposal - Low Intensity Conflict (EOD-LIC). [Ref. 29:p. 15] Most funds in this account had been programmed for projects at Department of Energy Laboratories or universities; none had been earmarked for Service engineering centers. [Ref. 29:pp. 22-25] Furthermore, the office of the ASD(SO/LIC) had no formal process for selecting needs for this budget program into which USSOCOM could formally integrate SOF requirements. [Ref. 29:p. 36]

Nevertheless, the Special Operations Special Technology (SOST) budget project was initiated in FY 90 to rapidly transition available technology to SO-peculiar equipment. [Ref. 29:pp. 22-25] Fiscal Year 92 is the first year that SORDAC has fully executed its own budget, approximately $10m of which is designated for technology base investments. [Ref. 30] USSOCOM technology base programs relevant to the Soldier System are outlined below.

(2) Strategy. Soon after the establishment of USSOCOM, the command realized that provisions for a SOF technology base program had to be made. The first step was to appoint a PM-Technology Base in April 1990, and outline the "guiding principles" of the SOF technology base program to direct and focus his efforts. [Ref. 29:p. 9]

These principles essentially shape a five point technology base strategy. [Ref. 29:pp. 9-14]

First, because of the limited budget, USSOCOM must aggressively leverage the resources of other DoD technology developers in order to increase the impact of MFP-11 funds on technology development. The House Appropriations Committee report in June 1991 on the DoD Appropriations Bill for 1992 stated that the "exploitation of technology that can be used by Special Operations Forces rests within the technology base funding provided by the Committee to all Defense research activities." This statement was supported in conference by the Senate Appropriations Committee. [Ref. 29:p. 10]

Second, USSOCOM will foster technology base teaming at every opportunity. USSOCOM should seek to bring appropriate Service and DoE labs together to leverage expertise, as well as funded developments, to obtain the best utilization of resources, and to present SOF requirements. [Ref. 29:p. 10]

Third, USSOCOM will develop mechanisms to maintain a close link between validated user requirements and specific RDT&E investments, and matrix technology base needs with the developing community. [Ref. 29:p. 11] This requires the PM-Technology Base to develop a USSOCOM Technology Base Master Plan, integrated with the Modernization Plans of both the J5-7 and the Services and Federal agencies.

Fourth, USSOCOM will attempt to influence the total Government technology development process so that the SOF mission area can become the demonstration environment for the early employment of emerging technology. [Ref. 29:p. 12] USSOCOM seeks to position SOF as a recipient of new technology so as to evaluate that technology in the SOF operational mission environment. This will allow laboratories to gain operational insight on technology developments while providing an initial capability to SOF. In many cases, demonstrators or prototypes will fill the need for SOF in a real world operational environment. [Ref. 29:p. 14]

Finally, the 6.2 and 6.3A funds made available to SORDAC should be carefully targeted to support the above four points. Specifically, this means seeking opportunities to "spin-off" technology from the developments of Service labs or the requirements of other organizations. If a Service or Agency development is already resourced and a slight shift in development direction will meet the SOF

requirement, USSOCOM will negotiate the funding of this shift. It also means that USSOCOM should try to accelerate technology developments when the Service priority does not meet the needs of SOF. This acceleration must be justified by the critical need of SOF for the capability the provided by the technology development. [Ref. 29:p. 13]

In reality, about 70 percent of the SORDAC technology base funds are 6.3A. These funds have been programmed equally between proof of principle demonstrators and ATTDs based primarily on the desire for the initial hardware from these activities to meet immediate SOF requirements. [Ref. 30] Category 6.2 funds have been "spent so as to shift service efforts to meet SOF needs when Service sponsor's requirements are slightly different from those of USSOCOM." [Ref. 29:p. 11]

The second step taken by USSOCOM to create a viable technology base effort was to establish the Special Operations Development Program Element in the MFP-11 RDT&E POM, funded beginning in FY 92. In addition to the previously established SOST Project, mentioned above, this program element provides for two new projects, both relevant to the Army's Soldier System. [Ref. 29:p. 15]

(3) Soldier System Related Programs

The two technology base budget projects programmed for start in FY 92 - Special Operations Technology

Base and Special Operations Medical Research and Development - are intended to support long term SOF material development. [Ref. 29:p. 15] Both ought to be integrated into the Army's Soldier System in order to conform to the stated "guiding principles."

Within the Special Operation Technology Base account are funds for eight projects directly related or overlapping with Soldier System RDT&E. Foremost is the $950K (6.3A) "Joint Technology Base" project for three technology demonstrators - "Individual Signature Reduction," the "Battle Dress System," and "Lower Extremity Assistance for Parachutists (LEAP)." The signature reduction project is intended to develop "chameleonic" camouflage clothing to reduce daylight, thermal and infrared detection. The battle dress system will incorporate this camouflage into a "complete head-to-foot battle uniform...of a modular design able to function separately or as an integrated unit." Both are being developed by the Army's Human Engineering Laboratory (HEL) and Natick RDEC. The LEAP project, pursued jointly at Natick RDEC and the University of Utah, is for an "exoskeletal" device to protect parachutists with heavy loads. [Ref. 29:pp. 15-22]

The other relevant projects are the $200K (6.2) concept study for an "Individual Operational Ration" at Natick RDEC and USARIEM, the $300K (6.3A) contribution to the C-17 wireless intercom demonstrator at the Air Force Wright

Laboratories, the $200K (6.2) SOF power source concept study at Belvior RDEC (to transition into $1.1M under the SOST project in FY 93), and the $350K (6.3A) "Manportable Non-Line-of-Sight Weapon System" with the AMC Missile Command (MICOM), Armaments RDEC, and Chemical RDEC. [Ref. 29:pp. 15-22]

The Special Operations Medical Research and Development Project, underfunded at $299K in FY 92 and earmarked to support validated Navy requirements, stands to benefit greatly from integration with the Soldier System. As part of the ASB study, the Army Surgeon General's Director, Medical R&D Planning formally offered to assist USSOCOM in developing an SOF Medical Modernization Plan and medical input into the SOF Technology Base Master Plan. [Ref. 29:p. 26] This is further discussed in Chapter VI (Conclusions).

H. CURRENT DA-SORDAC CONTACTS

1. SO/LIC Coordinating Group

In February 1990, the Army established a "SO/LIC Technology Base Coordinating Group" to identify long term capability requirements in future Low Intensity Conflicts. Chaired by the AMC Technology Planning Management Office, additional voting members were from TRADOC headquarters, the office of the ASD(SO/LIC), USAICS, JFKSWCS, and USSOCOM. [Ref. 29:p. 39] USSOCOM, represented by the PM-Technology Base, presented 37 desired capabilities, 32 of which were accepted

as joint desired capabilities for the Army and SOF. The other five were considered SO-peculiar, but the membership chose to allow them to be considered for development by the Army technology base community. [Ref. 29:p. 39] All 37 desired capabilities were briefed to the Army labs and RDECs, who then provided technology development plans for each initiative. [Ref. 29:p. 39] During this process, the Coordinating Group Chair informed the participating labs and RDECs that $700K was immediately available from AMC Technology Base funds for initiating or accelerating developments. They were also told that the Group would recommend to the TBAG those projects that warrant continued funding or require addition resources. [Ref. 29:p. 39]

In August 1990, the 32 proposals were reduced to 10 projects for presentation to the TBAG for funding support. Unfortunately, Operation Desert Shield took all the Army funds for this effort and the Group Chairman became the AMC Desert Shield/Desert Storm Project Officer. MG Harrison, the current CG, LABCOM, and Director, AMC Technology Planning and Management, has stated that he will reestablish the SO/LIC Coordinating Group as soon as USSOCOM has developed modernization and technology base master plans. [Ref. 29:p. 40]

Although disbanded at this time, the SO/LIC Coordinating Group brought the Army light forces, the Soldier System technology base community, and SOF together to develop and

review desired capabilities for the future. It proved to the Army requirement and the technology base developers that SOF requirements could be merged with those of the Army. [Ref. 30]

2. Army Technology Base Master Plan

During the sessions of the Army SO/LIC Technology Base Coordinating Group, the USSOCOM representative suggested that special operations be included in the next Army Technology Base Master Plan (ATBMP). [Ref. 30] It was determined that by allowing USSOCOM to participate in the coordination of the ATBMP, SOF co-sponsorship for particular Army technologies could assist in the funding decision process, adding emphasis to those technologies supporting the individual soldier or light forces capability development. [Ref. 29:p. 40] Therefor, since the staffing of the FY 91 ATBMP, the USSOCOM PM-Technology Base has been the Army point of contact for inclusion of SOF technology development needs. Special Operations is now formally recognized in the ATBMP as an Army Battlefield Capability Package. This will lead to Army support for common technology base developments because each functional area (aviation, C3I, etc.) is now linked to SOF technology base requirements. SOF needs will appear in the Army long range plan, provided J5-7 and J3-R can develop and validate SOF modernization plans in sync with the Army combat development process. [Ref. 29:p. 40]

3. TBESC Membership

In February 1991, USSOCOM participation on the SO/LIC group also led to an invitation from AMC for SORDAC to formally sit on the Army's Technology Base Executive Steering Committee (TBESC) for the Soldier System. The USSOCOM PM-Technology Base has represented SOF on the TBESC since April 1991. [Ref. 30]

4. Army Science Board Input

These developments led GEN Lindsay (Ret.), advisor to the ASB and former commander in chief of USSOCOM, to request a formal USSOCOM briefing to the ASB Soldier System study. The USSOCOM technology base PM was subsequently appointed as a Special Assistant to the ASB for this study. The result for USSOCOM was the ASB finding that SOF requirements for technology development may be the most difficult, and therefor should be considered as the "mark on the wall" for Army Soldier System RDT&E. [Ref. 29:p. 41] In addition, this presence reinforced USSOCOM efforts to encourage cooperation between TSM-Soldier, the relevant TRADOC combat development centers, the AMC and USAMRDC laboratories and engineering centers, and JFKSWCS. Each is now studying SOF and soldier requirements for the purpose of merging desired future capabilities. [Ref. 29:p. 42]

Another positive aspect of USSOCOM involvement with the ASB study has been to strengthen the medical RDT&E

relationship between the Army and USSOCOM Command Surgeon's office. The Command Surgeon was subsequently visited by Army medical RDT&E planners and invited into the Army Soldier System medical technology base planning process to present SOF medical requirements. Again, as coordination continues, the SOF medical requirements may become the marks on the wall. Prospects for success are discussed in the next chapter. [Ref. 29:p. 42]

5. **SMP Annex**

Another benefit of USSOCOM participation on the ASB study was TRADOC permission to include an SOF Annex to the Soldier Modernization Plan. Preparation of this annex has not only reinforced the integration of SOF requirements into the Army's long range technology plans, but also has the additional benefits of establishing more direct channels into Army combat developments and facilitating the emergence of a functional USSOCOM validation process. [Ref. 30] JFKSWCS was authorized to directly coordinate with TSM-Soldier, USAICS, and USAAVCS to develop the document; the USSOCOM J3-R would validate the final draft and insure its integration into the Modernization Plans being developed by J5-7. The next steps in this process are discussed in Chapter VI.

6. Other Contacts

Two other technology interfaces have been established subsequent to the DA-USSOCOM Memorandum of Agreement.

The "Board of Army Science and Technology/Science and Technology for the Army (BAST/STAR) Study" is a comprehensive Army study to identify all capabilities and technologies that should be pursued in the 1990s to transition the Army into the 21st Century. [Ref. 29:p. 44] The Director, SORDAC, has served as the SOF representative on the Special Technology Panel since October 1989. The USSOCOM objective is to balance the study's efforts in reviewing light, heavy, and special operations forces modernization. A draft BAST/STAR report was prepared after Operation Just Cause, but is undergoing almost total revision based on world events of the past 18 months. [Ref. 29:p. 45]

Finally, early in USSOCOM efforts to establish a SOF technology base and forge links with the Army, it was decided that an Army "FAST Team" should be requested for USSOCOM. An Army Field Assistance in Science and Technology Team is designed to coordinate quick reaction requirements for demonstrators and prototypes with the AMC. It is normally composed of a GM-15 science advisor, a secretary, and a GS-13/14 technical assistant, and assigned to Army Corps level units. AMC offered to have a FAST Team assigned to USSOCOM in June 1990, but several developments prevented its actual

arrival. The action is still being staffed. Two solutions are possible. Either the FAST Team currently at Fort Bragg will be split between USSOCOM and the Army's XVIIIth Airborne Corps, or a FAST Team currently assigned in Europe will be reassigned upon Corps deactivization. [Ref. 29:p. 45]

VI. CONCLUSIONS

A. OBJECTIVE

Many within the SOF community have long criticized the Army's process for equipping the individual soldier. Two perceptions have been especially antagonistic. The first of these is that the needs of special operations forces do not matter to the Army. The second of these is that the Army spends a great deal on research and development, but individual soldiers seldom benefit. They still carry the load bearing equipment used in the Korean War. Special ire is directed at Natick RDEC, which "puts 200 different pairs of boots on its shelves but none on our feet." It appears that the Army is trying to change this, and USSOCOM should be made aware of these changes and take advantage of them.

The objective of this thesis is to provide the USSOCOM technology base program manager with an unclassified reference document on the Army's "Soldier System," the collective term for these Army changes. This chapter presents findings answering the research questions, and offers analysis and recommendations for USSOCOM consideration.

B. FINDINGS

1. Soldier System Concept

- "The Soldier System" is a management initiative within the Army to bring the proven DoD "systems approach" to the acquisition of items used in combat by the individual soldier.

- The working definition of the Soldier System is "everything a soldier wears, carries, or consumes for personal use in a tactical environment" plus items that "affect the soldier's quality of life in the field."

- For soldier items, application of the systems approach requires a significant reorganization of the Army's traditional process of developing and managing material programs.

- The most ambitious reorganization, recommended by the Army Science Board, is for a General officer program manager directly reporting to the Army Acquisition Executive. This "PM-Soldier" would supervise the current program offices for Clothing and Individual Equipment and the 9mm Handgun, as well as two newly created offices, PM-NBC Protection and PM-Field Services.

- The Army's approach is to develop the Soldier System in "modules" (integrated helmet, individual weapon, body armor, etc.), each capable of operating separately or together with the other modules.

- The most revolutionary aspect of the Soldier System is the "skin-in, skin-out" approach to development. Pharmaceutical provided performance enhancement, bio-technical NBC protection, under-the-skin sensors, field rations, and traditional soldier hardware will be integrated in one development program.

2. Soldier System Requirement Development

- Articulating material requirements for items encompassed by the Soldier System has traditionally been the responsibility of TRADOC, as validated by the DCSOPS for most items other than CIE and medical; the Army Clothing and Equipment Board (ACEB), as validated by the DCSLOG, for

CIE items; and, for medical items, the US Army Health Services Command (USAHSC), as validated by the Army Surgeon General.

- The Army is currently centralizing these responsibilities to the TRADOC Systems Manager (TSM) Soldier. The proposed Soldier Modernization Plan (SMP), compiled by TSM-Soldier for signature by the Army Chief of Staff, is to be the guiding document for all future Soldier System combat and material development.

- The SMP, however, is not a "pure" material document. In order to charter "PM-Soldier," elements of the SMP must be further analyzed and refined into an Operational Requirements Document (ORD).

- Aside from the current budget climate, the primary obstacle to rapid development of a soldier System ORD is inadequate intelligence analysis prioritizing the likely threats to the dismounted soldier on the future battlefield. Such analysis was initiated in October 1991.

3. **Soldier System Technology Base**

- There are currently prototype demonstrators in Army laboratories that can provide significant increases in the combat capabilities of the individual SOF soldier.

- Collectively, these demonstrators are referred to as the "Block I Soldier," and are programmed for Engineering and Manufacturing Development beginning in FY 94.

- Near-term "leap ahead" advances are possible in the areas of Global Positioning, C3, aural sensors, and chemical-biological protection.

- Army management of Soldier System technology base development lacks a central focal point. The Soldier System TBESC provides a forum for coordination, but does not control funding, and subsequently cannot make programmatic decisions. The Director, AMC Technology Planning Management is the commander of LABCOM, but does not control PM-CIE. PM-CIE has RDT&E responsibility for CIE, including the Block I Soldier "cornerstone" SIPE ATTD program, and sets policy for Natick RDEC. The full scope of the Soldier System, however, is much broader than just CIE, and PM-CIE has additional non-Soldier System responsibilities. Soldier System medical technology base research is

managed outside of AMC by the US Army Medical R&D Command (USMRDC), primarily through USARIEM.

- In reality, much of the current Soldier System related technology base research is at the discretion of at least 10 different Army research centers.

- Current research lacks both a "peer review" process and firm links to the requirement development process. The ASB found that most current research is dominated by "parochial interest," primarily of Natick RDEC.

4. Soldier System Program Management

- There is currently no single Soldier System material developer.

- PM-CIE, in addition to supervising CIE RDT&E, has acquisition and life-cycle management responsibility for all Army CIE. PM-CIE managed programs are reviewed by the old DCSLOG chaired Army Clothing and Equipment Board (ACEB), not the ASARC, and subject to the unique acquisition provisions of AR 700-86.

- The management of non-CIE Soldier System projects is widely dispersed across the PEO and AMC program management structure, and governed by AR 70-1.

- Several Army studies over the last 24 months have recommended that a single Soldier System material developer be chartered. Most significant of these studies was the ASB, as mentioned above. This step is still pending, although a decision might be made in March 1992.

5. Soldier System Funding

- There is no central control of funding for the Soldier System.

- Assessments of the total current investment programmed for the Soldier System vary widely. RDT&E for FY 92-98 is calculated between $278 million to $1.074 billion, depending on system definition. Programmed Procurement spending for this period is between $718 million and

$1.359 billion. The higher amounts are from the SMP, the most current source of information.

- By these assessments, a Soldier System program office would have to chartered as a DoD Major System.

6. Emerging Army Process

- TSM-Soldier is fully established as the focal point for Soldier System requirement development.
- The draft SMP has been in use for over 12 months. The SMP is being updated to incorporate "quality of life" issues raised after Desert Shield/Storm, and should be signed by the Chief of Staff in March.
- Because of the lack of an ORD, the Army is at least 12 months away from a chartered Soldier System program office.
- Appointment of a Special Task Force to develop the ORD, therefore, is the most likely next step towards a single material developer.
- The conflicting requirement validation, program control, and funding responsibilities between AR 70-1 and AR 700-86 must be resolved in order for PM-CIE to be integrated into a Soldier System management office.

7. USSOCOM Acquisition Strategy

- USSOCOM is vested with responsibilities for the combat development, requirement validation, acquisition and funding of items used exclusively or urgently needed by its assigned forces.
- USSOCOM has implemented a sound strategy for material development to meet validated needs "crosswalked" from the Services.
- For USSOCOM to fully "maximize" its acquisition authority, it must develop interface channels into the acquisition processes of the Services. In addition to "top-level"

Service material developers, this means establishing links to combat developers and technology base planners.

- Until very recently, less emphasis has been placed on long-term systematic modernization planning to integrate SOF needs with the combat development and technology base plans of the Services, or to execute internal channels for requirement validation.

- USSOCOM has articulated a particularly clever technology base strategy. Because of the "growing pains" of the USSOCOM acquisition process, this strategy has not yet been fully implemented.

8. USSOCOM Acquisition Process

- As intended by Congress, the establishment of USSOCOM has significantly altered the acquisition process for items used by SOF.

- The emerging USSOCOM acquisition process promises to meet the long-term Congressional intent of institutionalizing a high level of material readiness for SOF.

- The primary weakness of USSOCOM acquisition to date has been in establishing effective channels for long-term combat development and requirement validation.

- For the Soldier System, one aspect of this weakness has been the "growing pains" of integrating the various combat development channels transferred to USSOCOM control. The JFKSWCS-USASOC-USSOCOM roles have been established slowly.

- Another aspect of this weakness has been redefining the relationship between JFKSWCS, USASOC and TRADOC for coordinating combat developments.

- A third aspect of this weakness has been integrating the SOF technology base planners into the combat development process.

9. Current USSOCOM-Soldier System Interfaces

- Army Soldier System developers are very receptive to integrating SOF requirements into Army plans.
- Reasons for this receptiveness include "institutional memory" of the key individuals at USAICS and TSM-Soldier, the perception that many SOF requirements are more "justifiable" to Congress in the current budget climate, Army desire to pool all available resources to maintain programs, and professional recognition that a significant capability requirement overlap exists for SOF and light infantry.
- In addition to the formal top-level DA-USSOCOM MOA for program management, other channels have been opened in the last 18 months. The most significant of these have been the SO/LIC Coordinating Group, SOF input into the Army Technology Base Master Plan, USSOCOM participation in the ASB Soldier System study, and submission of a draft SOF Annex to the SMP.
- Contacts have been established with the Army medical acquisition community that promise additional long-term increases in SOF capabilities. In the short-run, these contacts can improve the quality of the current USSOCOM acquisition plans.

C. ANALYSIS: FUTURE PROSPECTS

1. Soldier System Prospects

USSOCOM has expressed two concerns about the Soldier System. One is that the Army might not carry through the required organization. The other is that the needs of the SOF soldier might still receive low priority within the Army Soldier System program. Both fears are well justified historically, but neither should inhibit USSOCOM enthusiasm for the Soldier System.

The principal ambiguity in the current Army plan is the Soldier System definition. The original focus was to develop a head-to-foot combat system - integrated C3, weapon, body armor, uniform and load bearing equipment. This is what Army SOF has long desired. Since the Gulf War, this concept has grown to include "quality of life issues," defined by the Chief of Staff to encompass all Army soldiers, field services, medical care, and rations. As Army plans are being rewritten to reflect this broader definition, it is not clear what sort of material development office will be established to manage the program.

A single material manager to accomplish the original focus, however, will certainly be found somewhere in the new structure. It will probably be built around the current PM-CIE, rechartered for ASA(RDA)/AAE program control. The head-to-foot Block I Soldier, furthermore, is the least risky aspect of the Soldier System program concept, and therefor the most likely to transition to development in the current budget climate. The chances that the Army will not change its traditional non-systems approach to individual soldier items is small.

The concern that SOF needs will remain a low priority ought to be a reason for increased USSOCOM interest in the program at these early stages. This is discussed in detail below. Years from now it is possible that infantry and SOF needs will diverge. Light infantry, for example, may desire

increased ballistic protection and SOF increased chameleonic camouflage from the same field jacket. Right now, combat soldiers from every community ought to work together to establish a program capable of bringing about such choices. The Army's programmed FY 92 RDT&E expenditures for the Soldier System are greater than the entire MFP-11 RDT&E budget. For USSOCOM, there is much less risk involved by working with the Army than attempting such a development alone.

2. **USSOCOM Prospects**

Reliance on top-level acquisition channels, characterized by the DA-USSOCOM Memorandum of Agreement and JROC process, are not the most effective mechanisms for USSOCOM to influence the Army's emerging Soldier System acquisition process. It would be far more effective to interject SOF needs into the Army's long-term acquisition plans as early in the process as possible, to maintain open and multiple channels of communication throughout the requirement development cycle, and to implement the SOF technology base strategy. After these steps, USSOCOM can use its top-level authority to appoint a program monitor and participate on the Soldier System ASARC.

One option for USSOCOM to accomplish such a close involvement with the Soldier System is to push for its designation as a Joint Program under Part 12, Section B of DoD 5000.2.

Contacts established over the last 18 months, however, have opened the possibility for USSOCOM to achieve the same objectives within the current Army structure.

As established by the SO/LIC Coordinating Group and ASB, "SO-peculiar" for the Soldier System really means "level of capability" or "urgency of need" rather than a unique piece of equipment. The Army's senior leadership has concluded that Army SOF requires the highest level of capability. The Soldier System ORD will articulate these requirements, provided USSOCOM can effectively communicate them to the Army's combat developers and technology base managers.

The first step to accomplish this, already recognized by USSOCOM and outside the scope of this thesis, is eliminating the backlog of unvalidated requirements and plans in the J3-R. Other steps must follow. To start, the USSOCOM staff directorates with modernization planning responsibilities must complete their plans in order for SOF modernization plans to be matrixed with those of the Services. Furthermore, without these SOF modernization plans SORDAC cannot realistically develop a SOF technology base master plan to matrix with the Service master plans. Without matrixing all such plans, overlapping capability requirements simply cannot be identified. Without such identification, it is not possible to prioritize SOF needs within the Services.

Likewise, USSOCOM requirement developers and resourcers should realize that it is validated modernization

objectives, not mission need statements, that the SOF technology base program manager needs in order to leverage the Services' technology base communities. In the Army, there is extensive technology base input into the combat development process, and funds are made available for "non-systems" and collaborative research prior to mission need statement approval. If USSOCOM is to have a technology base program - and it is essential that it does in order to accomplish the stated acquisition objectives - it must give its technology base manager similar responsibilities. JFKSWCS and USASOC cannot prepare requirements documents without knowledge of the current technology base, managed at USSOCOM. Although a few well-invested MFP-11 dollars can leverage a much larger amount of Service funding, the Service laboratories will not work for USSOCOM for free.

Over the past 18 months, USSOCOM has taken the important first steps to interface directly with the Army's technology base, highlighted by input into the Army's Technology Base Master Plan and membership on the Soldier System TBESC. The next steps, therefor, require thorough USSOCOM planning.

Additionally, the best long-run mechanism to leverage Army acquisition and insure equipment interoperability might be iterative Army SOF input into Army combat developments. Initial matrixing of USSOCOM modernization plans with Army master documents is important, but TRADOC's CAC and CASCOM

perform a critical on-going integration function within the Army one level below TRADOC headquarters. JFKSWCS is the appropriate USSOCOM asset for iterative participation in this process. USSOCOM authority to validate Army SOF combat developments should be viewed as similar to Army DCSOPS responsibility to validate TRADOC requirements - it should not be used to inhibit information sharing. The caveat is that J3-R must also integrate SOF requirements identified by non-Army SOF channels, and must insure that these needs are communicated when necessary to the Army as well.

Under the current DA-USSOCOM MOA, however, there is no mechanism to insure such iterative SOF input into Army combat developments. TSM-Soldier had been established nearly 18 months, and the draft SMP in use for almost one year, before a draft SOF Annex to the Soldier System modernization plan was submitted. One option to prevent such slow response in the future would be a USASOC-TRADOC combat development MOA providing for standing JFKSWCS participation in the TRADOC process. For the Soldier System, such an agreement should be expanded to specifically include the JFKSWCS relationship to TSM-Soldier. As the J3-R validation backlog is reduced, JFKSWCS-J3-R interface should become smoother, further reducing SOF response time. Top-level submission of an Operational Needs Statement to the JROC can be used as an option of last resort when USSOCOM-TRADOC interface fails to meet a validated SOF need. Two other options to be considered

are negotiating USSOCOM representation on the CIE Army Clothing and Equipment Board and Clothing Advisory Group, and on the Soldier System Special Task Force, when one is designated.

The top-level authorities outlined in the DA-USSOCOM MOA are most useful only after the decision to establish a material development program. Under this agreement, USSOCOM should seek membership on PM-Soldier's ASARC, and appoint a program monitor for the Soldier System.

Two other aspects of the Soldier System, furthermore, offer unique opportunities to USSOCOM. The SOF technology base strategy seeks to establish USSOCOM units as a "technology test bed" in order both to satisfy immediate requirements and to maintain SOF capability on the leading edge of technology. The modular systems architecture of the Block I Soldier is ideally suited to this goal. This low-volume modular prototype test and fielding concept, furthermore, dovetails with the emerging long-range DoD acquisition guidance, and the Army strategy of fielding new equipment beginning with "first to fight" units. USSOCOM should vigorously pursue the application of this strategy to the Soldier System, to include senior command interface with the Army to include SOF units in the system test plan.

Second, the most revolutionary aspect of the Soldier System is the "skin-in, skin-out" approach suggested by the former SOF technology base manager. Army inclusion of

psychological and internal medicine considerations in a material system may prove unrealistic in the long-run, but it offers the immediate possibility of leveraging the Army to accomplish other USSOCOM objectives. Foremost among these objectives is establishing long-term interfaces with the Army's medical combat development and technology base communities, similar to those being forged with TRADOC and the AMC technology base. Another is overcoming the shortcomings of the "crosswalk" of medical funds and personnel. USSOCOM has been left underfunded and unable to perform long-range medical modernization planning. Contacts and plans established now should transcend the eventual resolution of the degree of medical involvement in the Soldier System. Again, an opportunity exists to use the Soldier System as a mechanism to significantly improve the long-term USSOCOM acquisition process.

In summary, USSOCOM should consider that few things excite its soldiers more than the quality and suitability of the equipment issued. Shortcomings in the traditional United States approach to equipping SOF led directly to the acquisition responsibilities of USSOCOM. A confluence of subsequent events - feedback from the Gulf War, collapse of the Soviet Union, declining defense budgets, a new DoD acquisition strategy, and the Army's emerging Soldier System approach - are transforming the Army's process for acquiring individual soldier items. The maintenance of concurrent and reinforcing

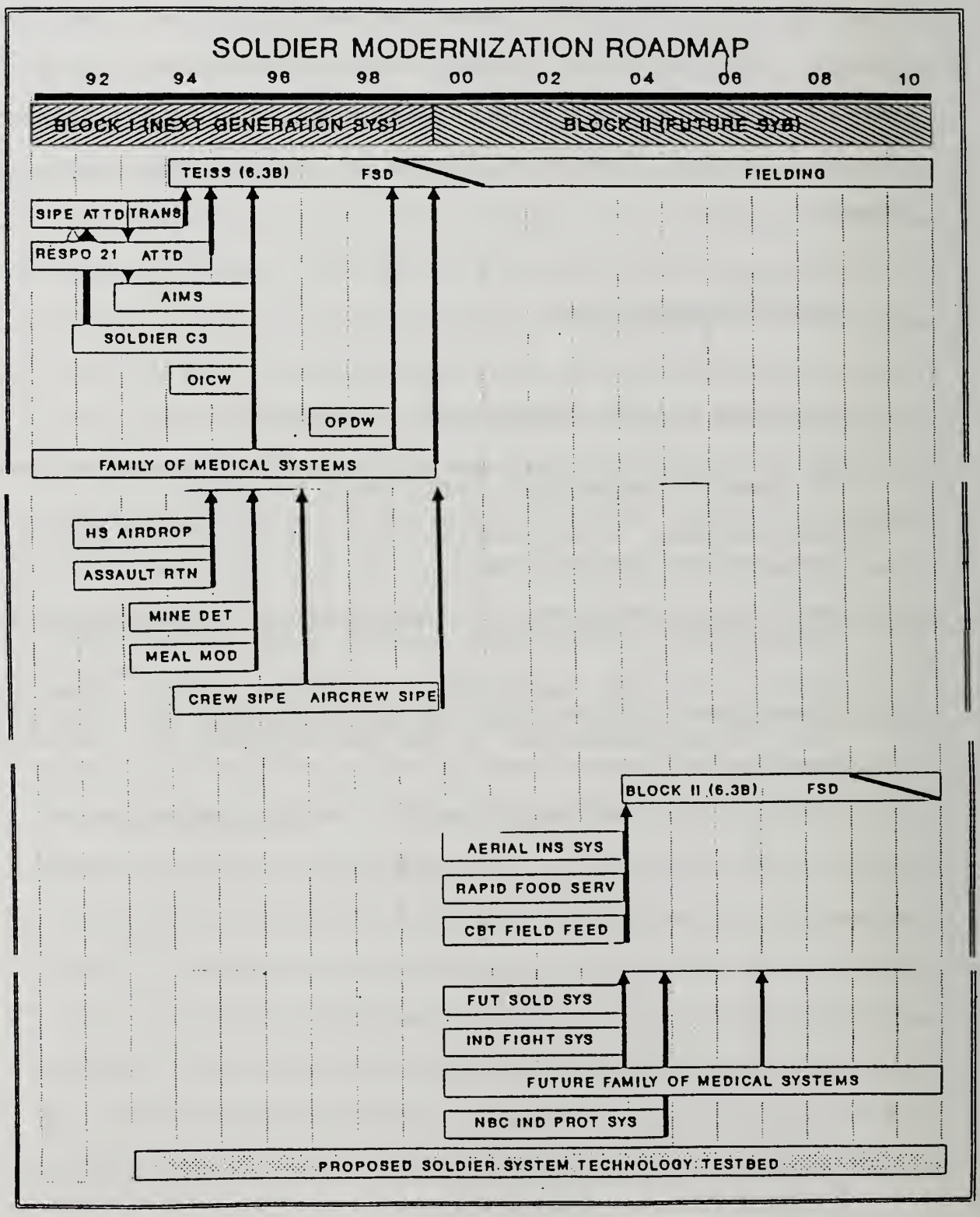
combat development, technology base, and top-level program management interface channels with the Soldier System is the most effective way to influence the Army's process to meet SOF needs. The principal concern of the Researcher - an Army Special Forces officer recently assessed into the Acquisition Corps - is that USSOCOM will miss an opportunity assert SOF needs.

D. KEY RECOMMENDATIONS

- Complete the SOF modernization plans.
- Matrix the SOF modernization plans with the Army's plans to identify capability requirement overlaps.
- Provide funds to execute the SOF technology base strategy for Soldier System items.
- Negotiate a Memorandum of Agreement defining the combat development relationships between Army SOF and TRADOC.
- After the Army designates a Soldier System material development office, use top-level channels to establish USSOCOM representation on the system ASARC and appoint a program monitor.
- Consider the Soldier System for Joint Program status.

APPENDIX A

SOLDIER SYSTEM ACQUISITION "ROADMAP"



APPENDIX B

SMP ORGANIZATION AND PROPONENTS

The draft SMP consists of eight chapters (a total of less than 30 pages) and nine Annexes compiled by the TRADOC Soldier System Manager (TSM-Soldier). The purpose of each Annex is to provide a single document summarizing all aspects of modernization within the subject area, including requirements, material and nonmaterial solutions.

The draft of a tenth annex, Annex J (Special Operations Forces), was submitted in October 1991. [Ref. 13]

	Subject	Proponent
Chapter 1	Introduction	TSM-S/NRDEC
Chapter 2	Threat	TSM-S/NRDEC
Chapter 3	Advanced Concept	TSM-S/US Infantry School (USAIS)
Chapter 4	Modernization Requirements	TSM-S/USAIS
Chapter 5	Assessment of Current and Future Capabilities	TSM-S/USAIS
Chapter 6	Soldier System Strategy	TSM-S/NRDEC
Chapter 7	Program Resources	TSM-S/NRDEC
Chapter 8	Conclusions	TSM-S/NRDEC
Annex A	Dismounted Soldier	USAIS
Annex B	Combat Crew (Mounted)	US Army Armor School
Annex C	Combat Crew (Air)	US Army Aviation Center
Annex D	Soldiers - All Others	CASCOM/CAC
Annex E	Field Services	CASCOM
Annex F	Technology Base	NRDEC
Annex G	Funding	AMC
Annex H	Training	USAIS
Annex I	Medical	USAMRDC

APPENDIX C

CIE DEFINITION (AR 700-86)

CIE includes most Army uniforms, insignia and accessories worn on or with required clothing. It specifically includes the initial and all supplemental items issued to enlisted soldiers under Common Table of Allowances (CTA) 50-900, including all individual and organizational items with ownership retained by the Army. In addition to actual uniforms and boots, this includes load bearing equipment, canteens, first aid and ammunition pouches, helmets, protective goggles (laser and ballistic), and NBC and cold weather clothing. CIE, furthermore, encompasses the required uniforms for officers and optional uniforms for all soldiers outlined in AR 670-1, and the issue of centrally procured heraldic items. In total, this covers the Army's 12 "utility", three "service" ("Greens"), and 9 dress uniforms.

CIE, however, does not include medical clothing and equipment (listed in CTA 8-100), or Life Support Equipment considered as a component of a major weapon system, such as flame retardant vehicle crewmen clothing. Nor does it include "other items as determined by the Department of the Army and so directed after proper Army Staff coordination."

APPENDIX D

ARMY MILESTONE DECISION AUTHORITIES (AR 70-1)

Table 5-1
Army materiel acquisition program categories and decision authorities

Program type and category	Program management	Milestone review forum	Program decision authority
MDAP			
DAB level	PEO/PM	DAB	SECDEF (DAE Agent)
Component (Army) level	PEO/PM	ASARC	SECARMY (AAE Agent)
ADAP	PEO/PM	ASARC	AAE
Nonmajor level I	PEO/PM	IPR	PEO
Nonmajor level II	Project officers or equivalent (designated by MATDEV)	IPR	MATDEV Commander
Nonmajor level III	Systems manager, commodity manager, or equivalent (assigned by MATDEV/RDE center)	IPR	MATDEV Commander

Note:
All levels are governed by the principles of AR 70-1; however, the MATDEV may tailor the disciplined management review forums for levels II and III providing that full accountability for systems is maintained.

Table 3-1
Milestone review considerations (see note)

Milestone	Review considerations
0—Enter concept exploration/definition phase.	Technology assessment; continuing MAA/requirements validation; nondevelopment/new development alternatives; life-cycle cost/affordability/stability; tailored strategy; industrial base; foreign cooperative opportunities; and operational utility assessment.
I—Enter concept demonstration/validation phase.	Threat assessment; program alternatives/tradeoffs; performance-cost-schedule trade-off strategy; acquisition streamlining/strategy; prototyping plan; affordability and life-cycle cost; potential common-use solutions; and cooperative development opportunities.
II—Enter full-scale development (and LRIP) phase. (IIIA may be required prior to III)	DAB committee before final RFP release; DAB review before contract award; affordability/cost-benefit/stability; risk vs. capability/criticality; production transition planning; surge/mobilization capability; common-use potential; demonstration-validation results; milestone authorization; MANPRINT; procurement/competition strategy; ILS planning; associated C3I/COMSEC; specific cost/performance goals/thresholds; acquisition streamlining; design-to-cost; and LRIP/LLT requirements.
III—Enter full-rate production phase.	Results of FSD phase; OT&E results; threat validation; cost verification and affordability; production and deployment schedule; RAM and ILS; producibility verification; realistic surge/mobilization capability; multiyear procurement/milestone authorization; MANPRINT; and associated C3I/COMSEC.
IV—Logistics Readiness and Support Review (1-2 years after FUE).	Logistics readiness/sustainability; weapons support objectives; ILS implementation; efficient/cost-effective logistic support activities; displaced equipment disposition; and affordability/life-cycle cost.
V—Upgrade/Replacement Review (5-10 years after FUE).	Continued capability to meet mission needs; need for upgrade/useful life extension; threat change; technology assessments; displaced equipment disposition; and major modification vs. retirement vs. new start alternatives.

APPENDIX E

SPECIAL TASK FORCE/STUDY GROUPS (AR 70-1)

Table 4-1
Composition of special task force

Position: Director **Source:** Best qualified officer in grade 06 or higher or civilian equivalent (PM designee excluded). For major systems and designated acquisition programs, Director STF or SSG will manage program between POM approval of the new start and completion of the Milestone I decision review. STF or SSG will be terminated at the discretion of the convening authority.
Position: Project manager (Designee) **Source:** Designee and individual.
Position: Materiel developer **Source:** As designated by DA (such as, AMC, COE, TSG, and PM). (Contingent may include nucleus of PM office). Include representative with contract experience.
Position: Combat developer **Source:** Normally, TRADOC
Position: User (as required) **Source:** FORSCOM (Force Structure and Readiness implications).
Position: Trainer **Source:** Normally, TRADOC.
Position: Technical support **Source:** USACCA.
Position: Resource programers **Source:** HQDA Staff.
Position: Logistic representative **Source:** HQDA Staff.
Position: Transportability agent **Source:** Military Traffic Management Command (MTMC) (when system is a potential transportability problem).
Position: Intelligence/threat support **Source:** ACSI/INSCOM/TRADOC (AR 381-19 and AR 381-11).
Position: Operational tester **Source:** OTEA or other designated tester.
Position: Development tester and evaluator **Source:** Normally, United States Army Test and Evaluation Command (TECOM) and Army Materiel Systems Analysis Agency (AMSAA).
Position: Manpower/personnel support **Source:** HQDA Staff or designated manpower agency.

APPENDIX F

DEPARTMENT OF THE ARMY SECRETARIAT AND STAFF FUNCTIONS: AR 70-1

Chapter 2, AR 70-1, details the duties and responsibilities of the key individuals and organizations within the Army acquisition framework, further delineating those established in the AR-10 series. These responsibilities are discussed in detail below. Responsibilities under AR 700-86 are in Section E (CIE).

Headquarters, Department of the Army

ASA(RDA)

The Assistant Secretary of the Army (Research, Development, and Acquisition) (ASA(RDA)) - currently also the AAE - is the focal point for determining program planning and funding, and providing staff "direction and control" on matters involving "research development, and acquisition; technical test and evaluation; procurement policy and procedures, competition and acquisition streamlining advocacy, and program/contractor reporting." [Ref. 21:p. 7] The ASA(RDA) schedules all major program reviews. The ASA(RDA) staff and advisory committees assist in this overall supervisory function. For the Soldier System, the most important ASA(RDA) representative is the Technology Base Executive Steering Committee (TBESC), discussed below in greater detail.

ASA(FM)

The Assistant Secretary of the Army (Financial Management) (ASA(FM)), in coordination with the ASA(RDA), receives and consolidates all RDT&E and procurement requests for integration into the Army Budget, and prepares the documents required to manage Army funds. In addition, the office of the ASA(FM) prepares the Independent Cost Estimate and establishes the Acquisition Category designation for inclosure into the program baseline.

DCSOPS

The Deputy Chief of Staff for Operations and Plans (DCSOPS) has Army staff responsibility to develop Army policy and guidance for all combat developments and material requirements. This includes validating requirements, overall force

structure and design, force integration and modernization, PPBS priorities, and user testing.

DCSLOG / ASA(I&L)

The Deputy Chief of Staff for Logistics (DCSLOG) and Assistant Secretary of the Army (Installations and Logistics) (ASA(I&L)) have responsibility for the logistical acceptability, interoperability, and supportability of material systems. The DCSLOG is the functional proponent for logistics related OMA funds and the acquisition of spares, and the Director of the Army Stock Fund.

DCSPER / ASA(MRA)

The Deputy Chief of Staff for Personnel (DCSPER) and Assistant Secretary of the Army (Manpower and Reserve Affairs) are responsible for the overseeing Army MANPRINT and Soldier Oriented Research and Development (SORD) Programs, and developing the Manpower Estimate Report (MER) for all new systems.

DCSINT

The Deputy Chief of Staff for Intelligence (DCSINT) approves and validates threat documentation for all MDAP's and ADAP's, including obtaining Defense Intelligence Agency (DIA) documentation, and is responsible for threat integration support of Army acquisition programs.

DUSA(OR)

The Deputy Under Secretary of the Army (Operations Research) (DUSA(OR)) is responsible for Army test and evaluation of both combat and material developments, and, in coordination with the DCSOPS, manages all user test programs.

Surgeon General

The Surgeon General (TSG) is responsible for Medical Readiness and Health Care Programs within the Army. This includes acting as a focal point for medical related combat and material developments, directly executing assigned Medical Readiness and Health Care Programs, and ensuring that all subordinate agencies involved in systems acquisition provide responsive functional support to Army programs.

DPAE

The Director of Program Analysis and Evaluation (DPAE) develops Program Objective Memoranda (POM's), including resource guidance; conducts affordability assessments to support major decision reviews (ASARC and DAB's); maintains the Army portion of the Five-Year Defense Program (FYDP) and manages the programming phase of the PPBS; and ensures the "overall discipline of the PPBS".

JAG

The Judge Advocate General (JAG) reviews the legality of the acquisition and intended combat use of each material and weapon system.

Other Army Commands and Agencies

The two primary Major Commands (MACOMS) with acquisition responsibilities in the Army are the Army Material Command (AMC) and Training and Doctrine Command (TRADOC). Each has several subordinate commands with prominent acquisition roles. Six other MACOMS have specific acquisition authorities within their purview, as outlined in AR 70-1. The only one of these directly relevant to the Soldier System is the Army Health Service Command (USAHSC). The responsibilities of AMC, TRADOC and USAHSC are discussed in detail in Chapter 3, along with the US Army Medical Research and Development Command (USAMRDC) and the US Army Medical Material Agency (USAMMA). In addition, several other independent Army elements have ancillary responsibilities. For the Soldier System, these include the Army Operational Test and Evaluation Agency (OTEA), the US Army Concepts Analysis Agency (CAA), the Army Nuclear and Chemical Agency (USANCA), the US Army Logistics Evaluation Agency (USALEA),

OTEA

The Army Operational Test and Evaluation Agency (OTEA) is responsible for the management of all Army Operational Test and evaluation (OT&E), as well as other specified test programs, including OSD-directed joint user testing, and chairing the Test, Schedule, and Review Committee for MDAP and ADAP programs.

CAA

The US Army Concepts Analysis Agency (CAA) assists the DCSOPS in analysis of all force related and selected material acquisition issues.

USANCA

The US Army Nuclear and Chemical Agency (USANCA) establishes and monitors NBC contamination and survivability criteria, and assist combat developers in applying these criteria to requirements development.

USALEA

The US Army Logistics Evaluation Agency (USALEA) is the logistician for all Army non-medical acquisition, including preparing the independent integrated logistic support analysis, and "participating" in the development of Request for Proposals, Statements of Work, and Contract Data Requirements Lists.

APPENDIX G

SOLDIER SYSTEM TBESC MEMBERSHIP AND PURPOSE

Membership

- ASA(RDA) Representative
- AMC Technology Base Manager
- Technical Director, CECOM
- Directors of each of the 10 AMC RDT&E Facilities conducting Soldier System research (See Appendix H)
- TSM-Soldier
- PM-CIE
- USAMRDC Technology Base Manager
- Technical Director, US Army Research Institute (ARI)
- Chairman, Battlefield Support, AMC
- USSOCOM Technology Base Manager

Purpose

- Focus and minimize overlap in Army Soldier System technology base projects.
- Develop the Technology Base/Major System "Roadmap" for the Soldier System.
- Identify "leap ahead" technologies, technology barriers, program linkages, opportunities for research leveraging, and funding shortfalls.
- Recommend Soldier System funding levels.

APPENDIX H

SOLDIER SYSTEM RDT&E FACILITIES

AMC

Armaments RDEC (ARDEC)	Small Arms
Aviation RDEC (AARDEC)	Life Support
Ballistics Research Lab (BRL)	Ballistic Protection, Casualty Reduction
Belvoir RDEC (BRDEC)	Small Engines, Water Purification
Chemical RDEC (CRDEC)	Respiratory Protection, Detection, Individual Decontamination
Electronic Development Test Laboratory (EDTL)	Batteries, Microelectronics
Harry Diamond Labs (HDL)	Acoustics, Augmentation Devices
Human Engineering Lab (HEL)	Human Factors, Compatibility
Materials Technology Lab (MTL)	Advanced Materials
Natick RDEC (NRDEC)	CIE, Subsistence, Air Drop, Shelters, Laundries and Baths

Medical

Research Institute for Environmental Medicine (USARIEM)	Physiology, Drugs and Vaccines, Nutrition and Rations

APPENDIX I

ACEB/CAG MEMBERSHIP (AR 700-86)

Army Clothing and Equipment Board (ACEB)

Chapter 4
Army Clothing and Equipment Board (ACEB)

4-1. Establishment

The ACEB is established as a continuing intra-Army board in the life cycle management of organizational clothing and individual equipment, personal clothing (service, dress, and distinctive uniforms); optional clothing; associated heraldic items; and uniforms included in the initial clothing allowance (clothing bag items).

4-2. Mission

a. The ACEB will review the requirement documents for any new or improved CIE described in paragraph 1-4, recommended by the CAG for development and introduction into the Army supply system.

b. The ACEB will also review policies pertaining to the wear of new or improved clothing and heraldic items.

4-3. Composition

a. With the exception of the Commander, U.S. Army Troop Support Command (CDR, TROSCOM) representing the material developer and TRADOC members representing the combat developer, the ACEB will consist of voting members assigned to the Army Staff. The board will be chaired by the DCSLOG. The board will consist of the voting members listed below. Each of the members will nominate a senior ranking alternate who will serve in his or her absence.

(1) DCSLOG—chairperson.
(2) DCSPER.
(3) Deputy Inspector General.
(4) Director of Requirements, ODCSOPS.
(5) ASA(RDA).
(6) DARNG.
(7) CAR.
(8) DEPUTY CHIEF of STAFF for Combat Developments, TRADOC.
(9) GG, TROSCOM.
(10) Senior female officer on the Army General or Special Staff.
(11) SMA.

b. Additions to the voting membership must be approved by the chairperson.

c. Technical advisers, those without vote, will include the Chief, Army Nurse Corps (if not the senior female officer on the Army Staff), the Director of the Army Budget, Office of the Assistant Secretary of the Army (Manpower and Reserve Affairs), Office of the Surgeon General, PM-CIE, AMC research and development laboratory, TIOH, AAFES, and Public Affairs Office (PAO).

Clothing Advisory Group

Chapter 5
Clothing Advisory Group (CAG)

5-1. General

a. The CAG consists of representatives from select MACOMs and key Army organizations, all with equal vote. presents the user community with an opportunity to express quirements and needs, thereby assuring that desired CIE ite are pursued from concept to issue. A primary purpose of CAG is to assure validation of need before initiating develo ment of an item and subsequently, to affirm that the item veloped is acceptable for use by the user community.

b. TRADOC (ATCD-SE) will administer the CAG, ens ing the agenda is prepared and distributed, background inf mation is provided to participating members sufficiently in vance to allow time for written responses, and will arrange briefings and briefing aids. TRADOC (ATCD-SE) will eva ate new CIE concepts, and determine those applicable for S CIE initiation.

5-2. Composition

a. The CAG will consist of voting members in the grade Colonel, except for the senior enlisted representative, from following organizations and activities:

(1) TRADOC DCSCD (chairperson).
(2) Forces Command (FORSCOM).
(3) AMC.
(4) FORSCOM senior female representative.
(5) Representative, Army Nurse Corps.
(6) Command Sergeant Major, TRADOC.
(7) U.S. Army Health Services Command.
(8) U.S. Army Europe (USAREUR).
(9) Eighth U.S. Army (EUSA).
(10) U.S. Army Western Command (WESTCOM).
(11) ARNG.
(12) OCAR.

b. Technical advisers, without vote, include, but are not l ited to—

(1) PM-CIE.
(2) ODCSLOG.
(3) ODCSPER.
(4) AMC RDTE Center.
(5) U.S. Army Academy of Health Sciences (AHS).
(6) USASPTAP.
(7) TIOH.
(8) U.S. Army Human Engineering Laboratory (HEL
(9) Army Research Institute of Environmental M (ARIEM).
(10) AAFES.
(11) DLA/DPSC.
(12) TECOM.
(13) Appropriate subject matter experts.
(14) Other military Services.

APPENDIX J

SPECIAL OPERATIONS MISSIONS

A. FORCES AND MISSION AREAS

1. Mission Areas

The title "special" is intended to highlight a contrast - special operations are missions which fall outside the training, tactics and organization of "conventional" units, but which nevertheless must be accomplished in order to achieve national objectives. According to United States typology, specific needs for special operations are derived from three general mission areas: Special Operations (SO), Psychological Operations (PSYOP), and Civil Affairs (CA).

Psychological Operations (PSYOPS) include strategic, battlefield, and special activities used to change or influence the attitudes and behavior of foreign audiences. Civil Affairs (CA) activities are conducted to establish and foster favorable relationships and assist host nation forces in the conduct of stabilizing programs of civil/military operations. Special Operations are missions encompassed by the typology below. [Ref. 36:p. 2]

2. Five Types of SO Missions

Officially designated Special Operations Forces (SOF) have five types of missions:

- Foreign Internal Defense. (This is "an interagency activity to assist friendly nations in responding to subversion, lawlessness, or insurgency." Special Operations Forces train, advise, and may assist military or paramilitary forces in carrying out their mission. [Ref. 36:p. 2])

- Unconventional Warfare. (Generally a long term military or paramilitary operation, this mission includes guerilla activities, evasion and escape, subversion, and sabotage. It is low visibility, covert, and clandestine.)

- Special Reconnaissance. (Conducted as a low visibility, covert, and clandestine operation, this type of mission accomplishes target acquisition, area assessments, and post strike reconnaissance.)

- Direct Action. (Direct Action is a "low visibility, covert, and clandestine offensive operation of generally short duration." [Ref. 36:p. 2])

- Counterterrorism. (An offensive operation to prevent, deter, and/or respond to terrorism.)

3. **Forces Assigned**

Special operations combat forces assigned to USSOCOM include: Army Special Forces ("Green Berets"), Army Rangers, Army Special Operations Aviation units, Navy SEALs, Navy Special Boat Units, and Air Force Special Operations units. Additional non-combat arms forces include Army Civil Affairs and PSYOP units. With the exception of Green Berets and SEALS, however, all personnel assigned to SOF return to their respective Service upon completion of their tour of duty in an USSOCOM assigned unit. This includes USSOCOM and subordinate command staff personnel.

4. Mission Characteristics

All five mission areas are essentially of a political-military nature; each is usually affected more directly by political considerations than conventional operations. Special operations may support conventional operations, or be conducted independently during peace or hostilities when conventional operations are inappropriate or infeasible. Special operations are frequently of a high-risk nature and are conducted generally in enemy-held, denied, or sensitive territory by specially trained, equipped, and organized joint Service forces in pursuit of national military, political, economic, or psychological objectives. [Ref. 36:p. 1] These operations differ generally from conventional operations in operational techniques, mode of employment, and dependence upon operational intelligence and indigenous assets. The nature of special operations demands that most intelligence be provided in far greater detail and currency than for conventional operations. [Ref. 36:p. 1]

Special Operations, PSYOP, and CA forces are employed across the spectrum of conflict. The role and mix of SOF, PSYOP, and CA forces may vary significantly, depending on the mission, environment, and available resources. In "High" and "Medium" intensity conflicts, SOF, PSYOP, and CA forces provide unique combat capabilities in support of conventional forces and national security objectives, usually in a "force multiplier" role. A few highly trained and specially equipped

soldiers, when deployed at the right time and place, can influence the outcome of a battle far out of proportion to their numbers - thus "multiplying" the forces available to a commander. [Ref. 36:p. 1]

In Low Intensity Conflict (LIC), indirect rather than direct application of U.S. military power has often been more effective. Special Operations, PSYOP, and CA forces provide the primary US military capability in this operational environment.

B. EMERGING ROLES AND NEEDS

Attempts by DoD to field special operations forces have often been unsuccessful. Historically, U.S. policy and strategy have emphasized the need to prepare for war at the upper end of the conflict spectrum. This emphasis has generated a strategic and conventional force mix which has successfully deterred such major conflicts, but has proven much less capable of producing the same results at the lower end of the conflict spectrum. [Ref. 36:pp. 1-2] Low intensity conflict and peacetime environments are marked by a proliferation of events which adversely impact on U.S. national security interests. These events - which include terrorism, limited conventional wars, insurgencies, subversion, propaganda and disinformation, illicit narcotics trafficking - occur under a different set of rules than conventional wars, and

require different weapons and tactics to deter or oppose their activities. [Ref. 36:pp. 1-2]

There is growing evidence, furthermore, that the future will see a increase in these type of events. Indicators of this include the decline of superpower influence, increased geographic displacement, increased economic interdependence, and greater diffusion of technology and arms transfers. [Ref. 29:p. 2] The aggregate of these environmental factors suggests a new order of national and regional power competitions with political and social uncertainty, and unpredictable threats. [Ref. 29:p. 2] There is also a high probability of protracted, indirect confrontations between contending states or groups. These LIC situations are expected to be more prevalent during the remainder of the 20th century. In this arena, U.S. policy recognizes that indirect applications of U.S. military power are the most appropriate and cost-effective ways to achieve national goals. Military forces capable of acting in proactive, preventive roles (e.g., planning, advisory, assistance, support, counter-propaganda) and conducting offensive operations when called upon, can serve as a highly effective instrument of US foreign policy in support of our national strategy in this operational environment. [Ref. 29:p. 2]

APPENDIX K

SPECIAL OPERATIONS MATERIAL CHARACTERISTICS

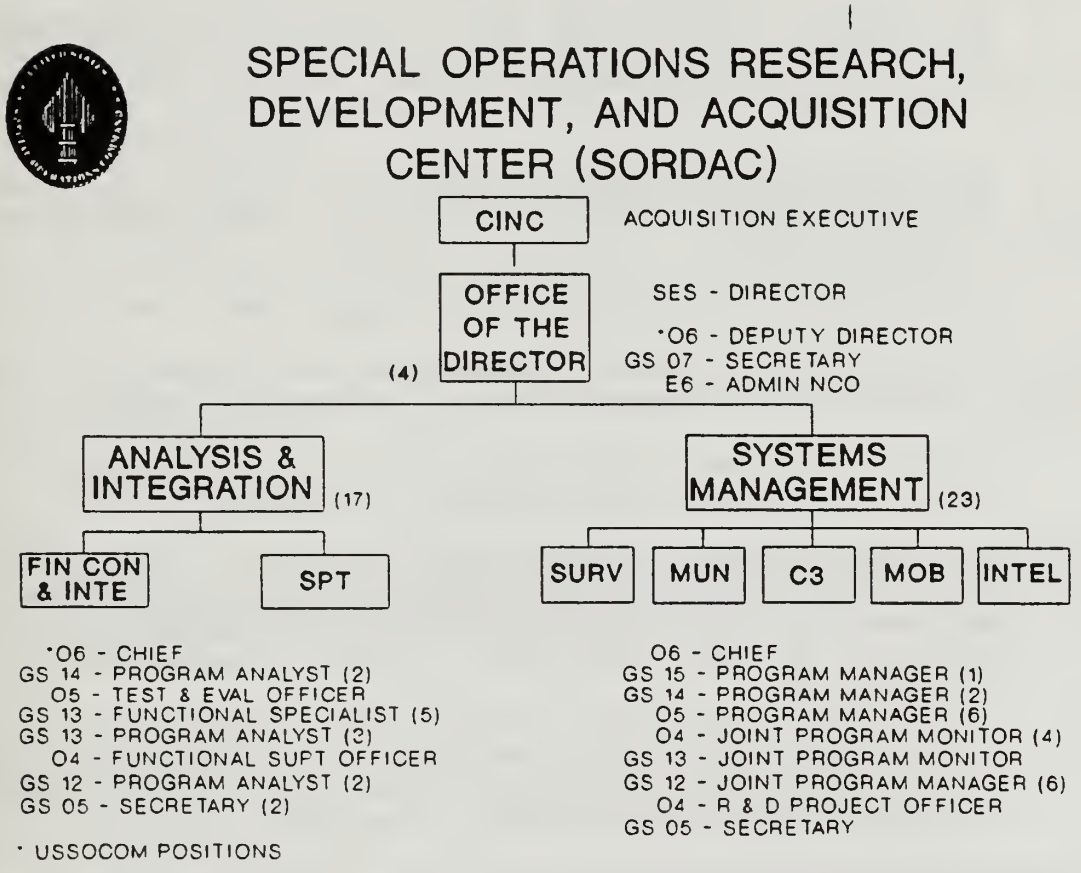
Based on the missions and operational environment for Special Operations, PSYOP, and CA forces, USSOCOM has established the following general desired operational characteristics for the development of SOF systems. [Ref 37]

- Lightweight and micro-sized.
- Low probability of intercept, low probability of detection, and jam resistant for all command, control, communications, and intelligence capabilities (C3I).
- Reduced signature, low observable.
- Highly lethal and destructive.
- Low energy/power requirements supported by standardized sources.
- Near real-time surveillance and intelligence and mission planning.
- Electronic warfare capable of disruption and deception of the enemy.
- Modular, rugged, reliable, maintainable, and simplistic with built-in survivability.
- Operable in extreme cold/hot temperatures, and water and pressure proof.
- Compatible with conventional force systems.
- Transportable by aircraft, ship, and submarine, and deployable by parachute drop.

APPENDIX L

SORDAC OGANIZATION

[Ref 37]



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